

CTO

Branding Tall on the Web PAGE 28

WebBusiness

S E C T I O N

DECEMBER 1, 1998

174 PAGES IN
TWO SECTIONS

Toy rannosaurus Rex

Two different
species of toy
retailers do
battle for online
supremacy

PAGE 40

Joel Anderson, VP of Toys "R" Us
Direct: Having a "big parent"
means clout and deep pockets
for investment

ALSO INSIDE
What's the ROI
of Self-Service
Human Resources?

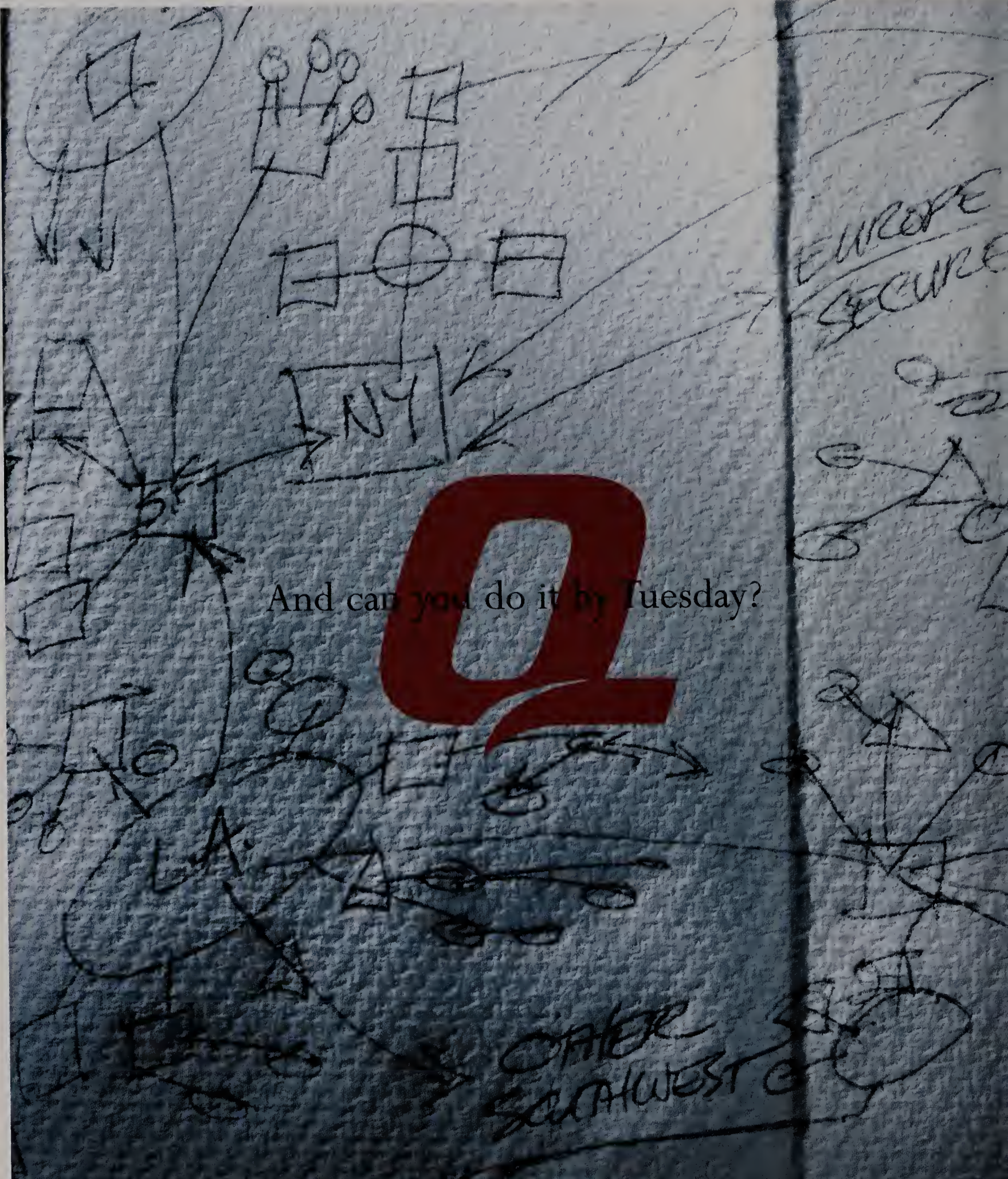
PAGE 56

Share the Wealth

Web leadership is a team sport.

For an organization to get full value from its Web investments, all members of the executive staff must understand this vital and fast-changing environment. With CIO Web Business, CIO Magazine leverages 11 years of experience bridging the gap between business and technology to bring the most enlightening and relevant stories to executives of all functions. So pass it along.





And can you do it by Tuesday?

If not us, then who? We now have one

COMPAQ

of the world's great IT service organizations

and products, offering them directly or

over the Web to partners, resellers and customers

Better answers.SM



ECKHARD PFEIFFER
President and
Chief Executive Officer

December 1, 1998

Dear CIO:

During the last few months, a lot has been written about Compaq's acquisition of Digital and the integration of the two companies. With the integration progressing well, I want to give you an update on Compaq's strategic direction and the actions we are taking to build even stronger relationships with our customers.

Our mission is very simple: We want to be your best computing partner. To us, this means several things. It means delivering a broad range of products, solutions and services that meet your diverse needs. It means providing useful, innovative technologies that give you a competitive edge. It means building strong partnerships with industry leaders like Microsoft, Novell, Oracle, SAP and many others, enabling us to deliver not only the best solutions but the best business value from your IT investments. And it means offering the most flexible and accountable customer engagement model.

We want to be your strategic IT partner, not just your hardware vendor. Our account teams provide "one face to the customer" representing all the products and services available from Compaq. This gives you a single point of contact and accountability. Our model also includes strong direct coverage, complemented by value added services from our channel partners. Our objective is very clear: to do business the way you want to do business.

During the past two years, we have transformed Compaq from a product-focused PC company to a solutions- and customer-focused global IT company. We have significantly increased our resources devoted to serving you. Today we have 5,000 account representatives and other sales professionals working with customers – more than double the number we had a year ago. And with Compaq Services, we have more than 29,000 service and support professionals deployed around the world.

In addition, we have a large, worldwide network of resellers, systems integrators and other partners. They are very important to our success and to the value we deliver to you, and we will continue to work closely with them.

I also want to underscore the investments we are making to support the technology and services we bring to market. Compaq is a leader in many of the key markets that will define enterprise computing in the new millennium, including the Internet, 64-bit computing, Windows NT, UNIX, networked storage and services. And we are focused on delivering comprehensive solutions, from packaged solutions running on industry-standard platforms to vertical solutions for targeted markets like manufacturing, finance and communications.

I want to reaffirm Compaq's commitment to Alpha and to 64-bit Digital UNIX and OpenVMS. This commitment includes continued investment in Alpha microprocessor design and in the highest-performance workstations and servers. And, we will continue to support and enhance OpenVMS.

We have also made a firm commitment to Tandem's NonStop technology. We recently announced that future generations of NonStop Himalaya servers will use the Alpha microprocessor.

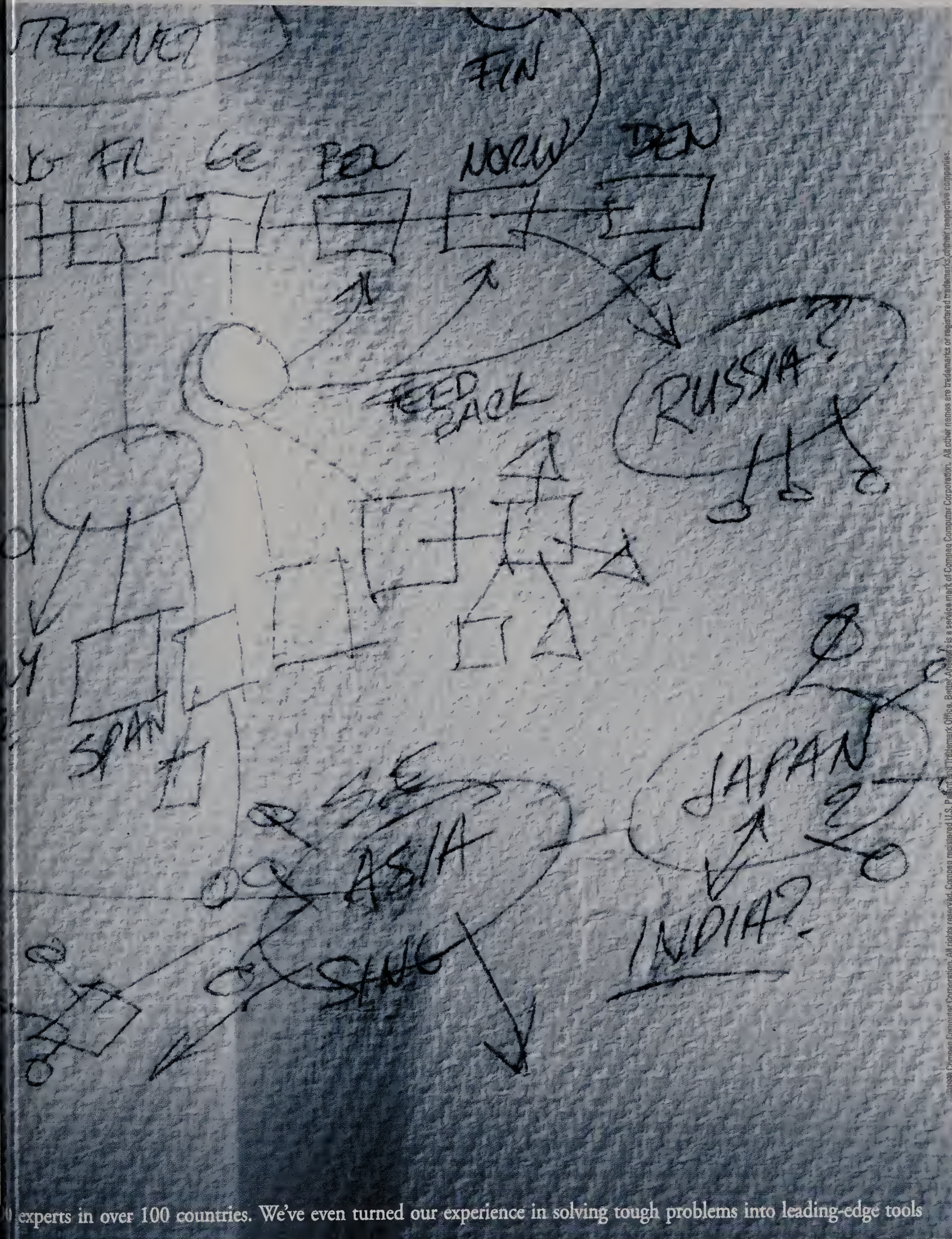
In the end, Compaq's strategy is not about products, services or distribution models. It is about customer satisfaction. That is our top corporate priority, and everything we do – from how we design our products to how we do business with you – is focused on enhancing our ability to respond to your needs, and to meet and exceed your expectations. We look forward to the opportunity to demonstrate why Compaq should be your IT partner of choice.

If you would like further information about Compaq, please visit our Web site at www.compaq.com, or call us at (800) AT-COMPAQ.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Eckhard Pfeiffer', with a stylized flourish at the end.

Eckhard Pfeiffer



©1998 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Compaq is a service mark of Compaq Computer Corporation. All other names are trademarks or registered trademarks of their respective companies.

experts in over 100 countries. We've even turned our experience in solving tough problems into leading-edge tools

at savings in time and money. For more answers, better answers, reach us at www.compaq.com/do or 1-800-AT-COMPAQ.



WebBusiness

SECTION

VOL. 12 • NO. 5 • DECEMBER 1, 1998 • 174 PAGES IN 2 SECTIONS
SECTION 2

FEATURES

40 **Whoever Sells the Most Toys Wins**



COVER STORY: E-COMMERCE eToys has the lead, Toys "R" Us has the brand. Their online battle may determine which matters most.

By Sari Kalin

50 **Tomorrowland**

INTERVIEW: BRAN FERREN Disney's Bran Ferren talks about CIOs, the Web and the costs of being behind the curve.

By Art Jahnke

56 **Personnel Connections**

HUMAN RESOURCES By moving select HR functions onto the Web, a growing number of companies are discovering the benefits of letting employees help themselves.

By Lynda Radosevich

on the cover

Network with
some friends to get
ahead on the Web.

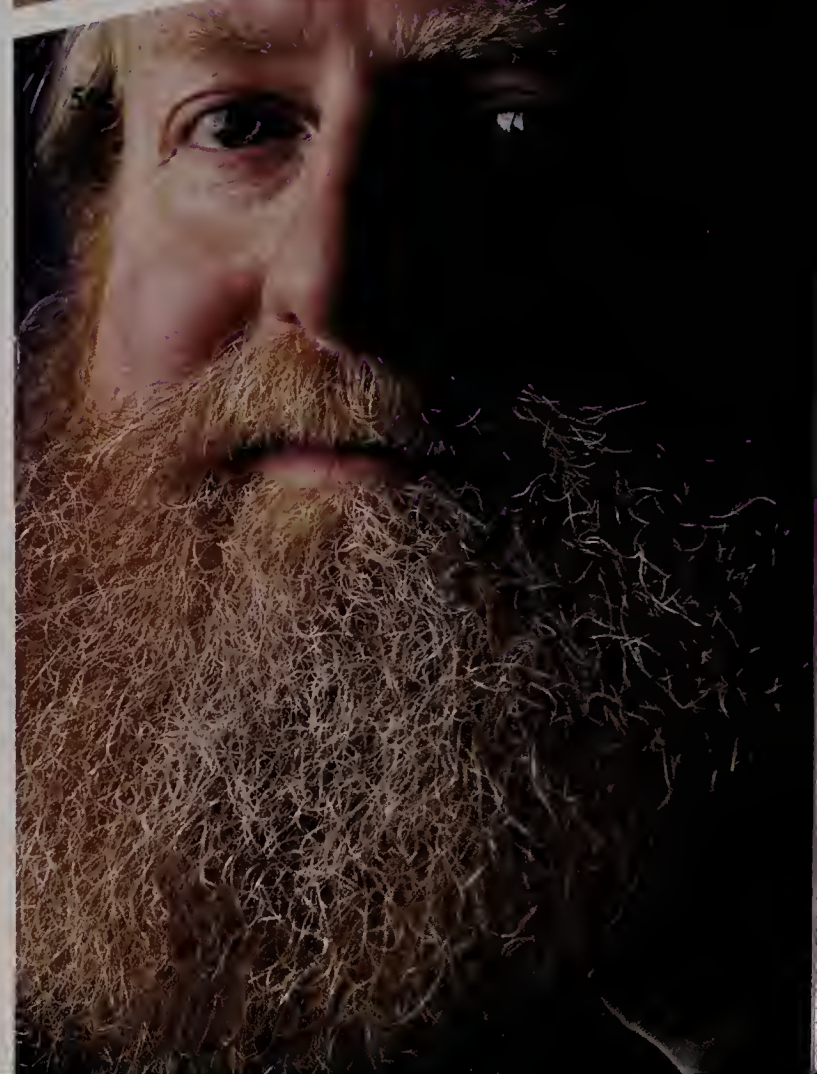


*Joel Anderson,
vice president,
Toys "R" Us Direct*

*Cover photo by
Mark Robert
Halper*



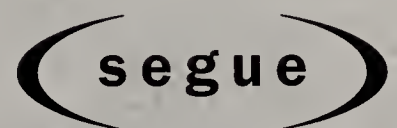
56



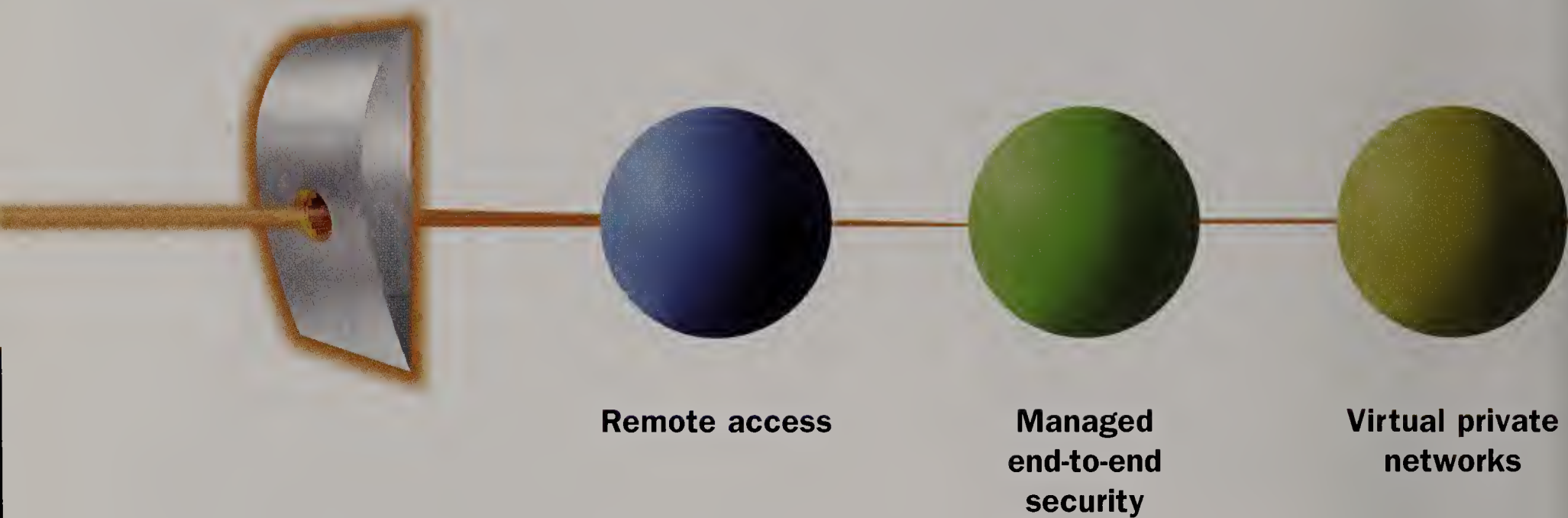


AFTER MONTHS OF EXHAUSTIVE WORK ON YOUR
E-BUSINESS APPLICATION, THIS COULD EITHER BE A GREAT PLACE TO VACATION,
or a great place to hide.

Whether your company congratulates you, or hires someone to track you down, may all be determined by how well your e-business system performs. That's why Segue Software offers a unique, system-level testing solution that allows you to simulate real-world scenarios in a safe environment. So if you have any problems, you can work them out long before the system goes live. And stroll freely through the streets of Paris, rather than don a fake mustache and a cheap beret. To learn more about *LiveQuality*, the industry's only end-to-end e-business scenario testing solution, visit us at www.segue.com, or phone 1-800-287-1329.



the e-business testing company



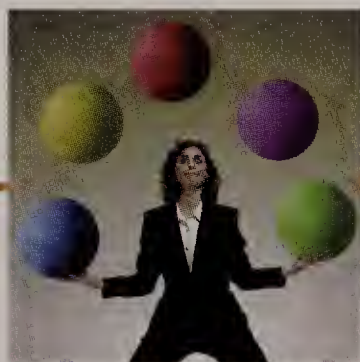
Managing your data network in today's business environment requires serious juggling. Need help? MCI WorldCom Advanced Networks is the answer. The data communications solution behind 3,000 of the world's largest corporations, Advanced Networks provides comprehensive Internet, Intranet, Extranet and hosting services to companies whose



Web hosting



E-commerce



**One company can
handle it all on a
single network.**




MCI WORLD COM
ADVANCED NETWORKS

success hinges on the flow of critical data. All executed by a single team, dedicated to customizing our services to meet your company's specific needs. That includes integrating solutions to help you migrate from your current network technology to next-generation IP solutions. For details contact us at 1-877-755-1680 or visit www.wcom.net/adv/an1.

COLUMNS

- 26 Next-Generation Leader**
NETREPRENEURS A teenage entrepreneur launches an online sales-lead company and, perhaps, an empire. *By Anne Stuart*

- 28 Branding Tall**
THE MAIN ATTRACTION Is your business positioned to be top-of-mind in the age of the Web? *By Scott Kirsner*



- 32 Is Spam Edible?**
GRAY MATTERS Sooner or later, every marketing person will be asked about sending unsolicited e-mail. Before answering, they should read this. *By Suzanne A. Smith and Emily Woodson Davis*

- 66 Promote and Deliver**
CUSTOMER INTERFACE Before you put out the welcome mat, know who might come calling. *By Jim Sterne*

- 70 Have It Their Way**
POWER SOURCE Tools for Web service let your customers get the help they need—when and how they want it. *By John Edwards*

- 78 New Itinerary**
BY REDESIGN This travel-products retailer wanted to provide customers with a rewarding journey into e-commerce. *By Sari Kalin*



DEPARTMENTS

- 10 Home Page**

- 12 In My Opinion**
 Letter from the publisher • On our Web site

- 16 Threads**
 The Company Dime • Save \$71 on Your Next New Car • Brand-New Bag • Off the CyberShelf • Small Is Profitable • Holt Everything • Spam Gain Without Pain

- 77 Index**



Inside Section 1

COVER STORY: LESSONS LEARNED

CIOs reveal the projects that did not kill them and made them stronger.

LEARNING FROM THE LAW The FBI is spearheading a new effort to defend against the ravages of information warfare. But are you ready to trust security to the feds?

CAREER COUNSEL How do the CIOs at high-tech companies—who juggle as many balls as you do or more—succeed in the pressure cooker of a booming industry? With all the technology toys at hand, believe it or not, they stick to the basics.

SOCIAL RESPONSIBILITY IT needs skilled workers; people need jobs. Three new programs kill both birds with one stone.

THINK TANK It's time we acknowledged that ERP systems are here for the long haul and start adapting to permanent life with them.

EMERGING TECHNOLOGY Its users sing the praises of this freeware operating system, but does it fit everywhere in the enterprise?

SHOP TALK Former CIO of Children's Hospital in Boston George Adler on getting advice.



Make **all** your
call center customers
feel at **home**.

Symposium is a portfolio of evolutionary call center solutions from Nortel Networks™. It allows your customers to contact your business in a variety of ways. And today, that's more important than ever when you consider that at least 70 percent of your customer interaction comes through your call center* – making it a virtual storefront. Plus, Symposium not only provides fax, e-mail and Internet access, it integrates simply into your existing network, thanks to its breakthrough server-based architecture and industry-standard platform. So, no matter how your customers choose to visit, Symposium can help make sure they always feel welcome. To find out more, visit www.nortelnetworks.com/J1CP or call 1-800-4 NORTEL, dept. J1CP.

NORTEL
NETWORKS™

How the world shares ideas.

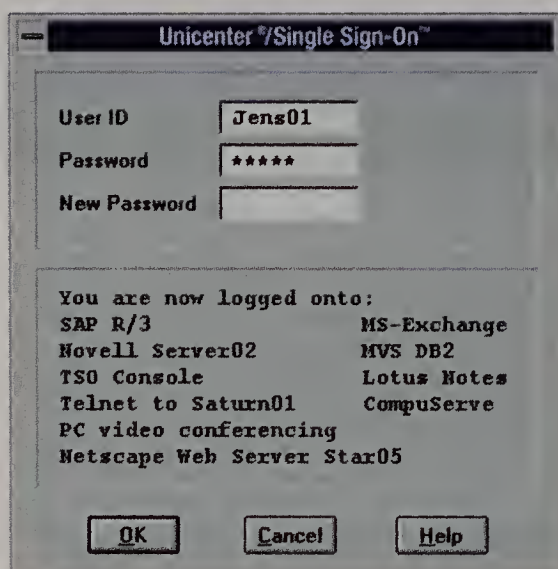
Our Software Corporate All Our Competi

More clients — including 462 of the Fortune 500 — trust CA security software than all the partial, proprietary solutions offered by IBM/Tivoli, Platinum and Boole & Babbage.

CA Security Software Is #1.

CA holds more security "firsts" than any other vendor. CA was the first to secure IBM's DB2 platform (two years before IBM). CA was the first to identify and address all the security risks of UNIX and NT. And with the introduction of ICE (Internet Commerce Enabled™), CA is the first to make it safe to do business on the Internet.

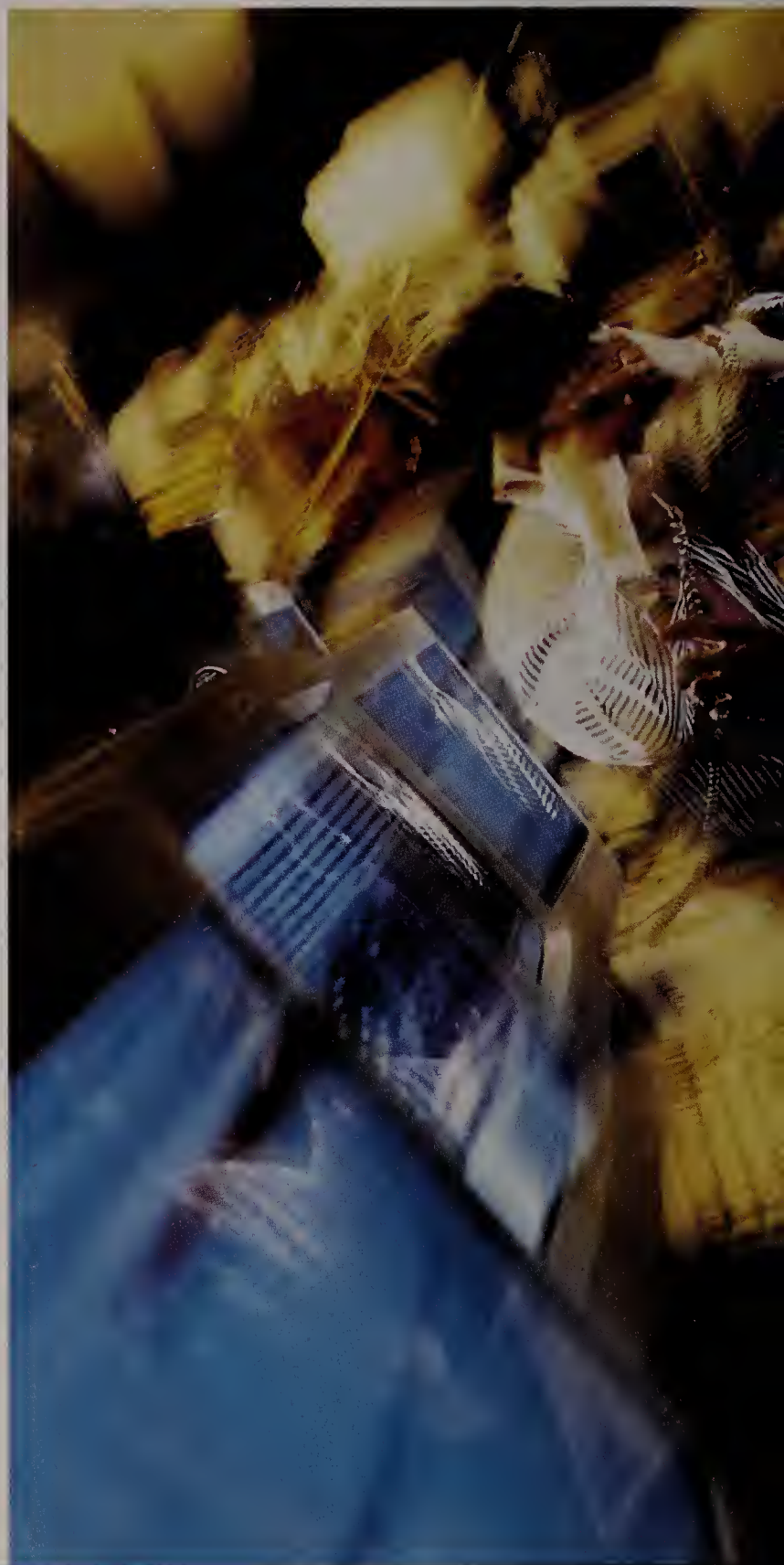
Unicenter TNG Is The Industry Standard For Network And Systems Management.



Single Sign-On lets users use one password and sign on once for every platform.

Unicenter® TNG™ offers the only integrated solution for true end-to-end enterprise management. With support for every major hardware platform and operating system, Unicenter TNG is open, scalable, extensible and 100% vendor-neutral. In addition, Unicenter TNG offers all kinds of powerful and exciting new features like a real-world, 3-D interface with virtual reality, Business Process Views™ and advanced agent technology.

No other management software offers anything like it.



Secures More Data Than Others Combined.



- ▲ Consistent Look/Feel Across Platforms
- ▲ Central & Localized Security Controls
- ▲ Full Audit & Control of OS Supervisor Functions
- ▲ Complete Access Controls
- ▲ Policy-Based Access Controls
- ▲ Multi-Platform Single Sign-On
- ▲ Enterprise-Wide Security Event Monitoring
- ▲ 2D, 3D & Web User Interface
- ▲ NT Workstation for Legacy Security Controls
- ▲ Secure and Manage Every IT Security Resource
- ▲ Focal-Point Security Administration

- ▲ Integrated Functions Built on Common Objects & Services
- ▲ Open Connectivity to Existing Systems and Applications
- ▲ Centrally View Any Security Event That Occurs Anywhere in the Enterprise
- ▲ Propagate Security Events from the C/S and Mainframe or Midrange Environments
- ▲ Extended Security Controls
- ▲ Windows-Based Administration
- ▲ Advanced Auditing/Reporting/Monitoring Cross-Platform

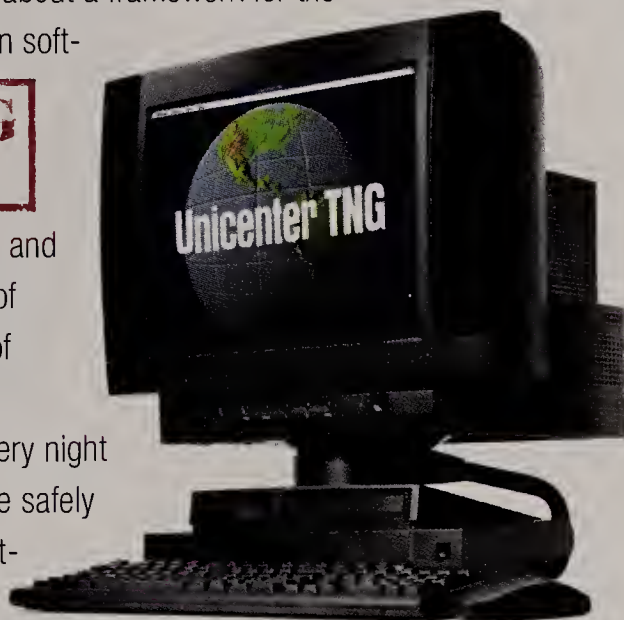
The Best Feature Of All Is Unicenter TNG Is Shipping Today.

While our competitors are talking about a framework for the "future," Unicenter TNG is a proven software solution that's available

**SHIPPING
TODAY**

today. It's real, it's mission-critical and it's up and running in thousands of sites around the world for some of the smartest clients in the world.

Our clients sleep soundly every night knowing that all their IT assets are safely protected by the best security software in the world. Shouldn't you?



**For More Information Call
1-888-864-2368
Or Visit www.cai.com**

**COMPUTER[®]
ASSOCIATES**
Software superior by design.

Unicenter[®] TNG[™]

©1997 Computer Associates International, Inc., Istantia, NY 11788-7000. All other product names referenced herein are trademarks of their respective companies.

See Me See You?

I RECENTLY APPEARED ON A TV PROGRAM ON BOSTON'S PUBLIC Broadcasting Service affiliate. The subject was a software program that enables managers to do remote "screen captures" and thus to see, surreptitiously, what employees are doing on their computers. I was invited to represent the viewpoint that using monitoring technology is legitimate in support of a valuable management objective. But I had told the producer upfront that I have mixed feelings about these tools, which, while effective in auditing employee behavior, have a potentially malignant collateral effect on morale.

I was seated next to attorney and Harvard Law School professor Arthur R. Miller, who was on hand to defend the principle of, if not the right to (since there isn't any), employee privacy and to decry the intrusiveness of the tool in question.

Miller did this forcefully (going so far as to humorously label the host a "running dog for the capitalist system"). I basically agreed with him, making for an uncontroversial, less-than-dynamic TV segment.

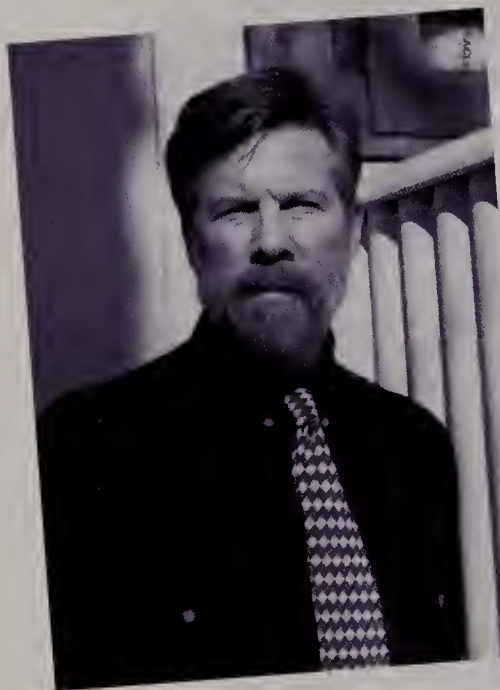
I've thought further about this subject since the taping session. More and more of these tools are becoming available, supported by marketing campaigns suggesting that most of what people do online from the office revolves around pornography, sports, personal interests and CD buying. Whether this is true or not is debatable, but businesses are increasingly concerned about the economics of inappropriate "resource consumption" and the impact on productivity of nonbusiness use of the Web.

It's tempting to define everything in an enterprise in starkest economic terms. If time and bandwidth are assets, then employees are seen as potential thieves who need to be watched.

In some corners of the enterprise—customer service call centers, for example—it may make sense to apply intrusive monitoring tools to ensure that human resources and service quality are maximized. But if you want people who think creatively, show initiative and put the needs of the enterprise and its customers first, treating them like would-be scoundrels is a massive lose-lose.

People's private and work lives have begun to blur. Statistics show that the workweek—after shrinking throughout the waning century—is lengthening. In an age when most of us sometimes—if not frequently—work at home, it should be permissible to transact a reasonable amount of private business at work. Enlightened employers understand this, and some, mindful of the trade-offs, use their intranets to help employees take care of personal business quickly and conveniently (see "The Company Dime," Page 16).

For me, this issue inevitably returns to the question of business culture: What sort of culture do you want? One that is open, creative, empowered, based on trust and respect? Or one that is distrustful, paranoid, risk averse, disenfranchised and alienated? Do the math. Then decide what benefit spying can deliver that will outweigh its ultimate cost.



Lew McCreary
Lew McCreary
Editorial Director
mccreary@cio.com



© CIO Communications, Inc.

President, CEO and Group Publisher Joseph L. Levy

Publisher Gary J. Beach

Editorial Director Lew McCreary

EDITORIAL

Editor in Chief Abbie Lundberg

Executive Editor Richard Pastore

Managing Editor Anne Stuart

Managing Editor, Production Cheryl R. Asselin

Senior Editors Howard Baldwin (West Coast),

Alice Dragoon, Carol Hildebrand, Art Jahne,

Christopher Koch, David Rosenbaum

Features Editors Elaine M. Cummings,

Todd Datz, Perry Glasser, Sandy Kendall, Katherine Noyes,

Megan Santosus (Web & Print)

Senior Copy Editor Sheila Neylon

Copy Editors Steve King, Meg Mitchell, Thomas G. Wailgum

Senior Writers Gary Abramson, Mindy Blodgett,

Peter Fabris, Tom Field, Sari Kalin, David Pearson,

Polly Schneider, Derek Slater

Staff Writer Daintry Duffy

Editorial Researcher Carol Zarrow

Editorial Assistants Kathleen Carr,

Meridith J. Levinson, Lynne Zouranjian

Editorial Operations Manager Lisa Jayne Kerber

Administrative Assistant Stacy Hague

Contributing Editors Cheryl Dahle, Alice Kelly

Contributing Writers Thomas H. Davenport, Emily Woodson

Davis, John Edwards, Amy Helen Johnson, Scott Kirsner,

Lynda Radosevich, Peter Ruber, Suzanne A. Smith, Jim Sterne

DESIGN

Group Director, Art and Design Mary Lester

Art Director Lisa Munroe

Associate Art Director Michael Siggins

Sr. Graphic Designers Hana Barker, Terri Haas, Steve Traynor

Graphic Designer Terri Mitchell

Associate Graphic Designers Kaajal S. Asher,

Robin M. Belliveau, Jessica L. Sepe

WEB SITE

VP / Technology and Webmaster Tim Horgan

Web Editor Stephen L. Singer

Senior Web Developer Dagmar Eiben

Web Developer Ellen Morey

Web Researcher Kathleen Kotwica

CIRCULATION

VP / Circulation Carol A. Spach

Circulation Manager Susan Woodworth

Subscription Svcs. Manager Denise Perreault

Circulation Coordinator Tina Pescaro

Circulation Assistant Kim Galloni

PRODUCTION

VP / Production Lori Beth Sadewitz

Senior Production Manager Resa Altscher

Production Associate Lee Tuttle

EXECUTIVE PROGRAMS

Senior VP / Exec. Programs Lynda Rosenthal

Director, Program Planning Susan T. Montgomery

Director, Programs / Event Development Robin L. Azar

Assistant Program Manager Thomas M. Pitkin

Manager, Program Operations Cynthia Laird

Technical Admin. Specialist Liz Hecht

Program Mktg. Specialist Jeremy E. Draper

Administrator, Program Planning & Finance Sandra J. Hughey

Fulfillment Manager Brian Fuce

Administrator, Exec. Programs Heather Beaton

Coordinator, Exec. Programs Michael Barbato

Manager, Ancillary Products Bill Kerber

Fulfillment Assistant Christina Cyr-Pereira

MARKETING

Senior VP / Marketing Cathy O'Leary Hayes

VP / Online Marketing Lisa Brown

Online Marketing Associate Michael McPhee

VP / News and Information Susan Watson

Media Relations Specialist Karen Fogerty

Research Director Bridget Cammarata

Market Research Analyst Caroline Cerullo

Marketing Comm. Director Marcy L. Dill

Marketing Comm. Specialist Lisa Wilson-Wirth

Cust. Service Rep. / ConsultWare Dot Caspersen

Marketing Assistants Julie Hanson, Kari Noah

ADMINISTRATION

Senior VP / Operations Walter Manninen

Assistant to the Publisher Diane Martin

Financial Analyst Kerry Grady

Accounting Specialist Chris Davis

INFORMATION SYSTEMS

VP / CIO David Woodall

Manager, Network Services James C. Burgoyne

Manager, Desktop Services Louise Pelletier

IS Specialists Simon Liang, Katy Tynan

PHOTO BY JERRY MARGOLYCH



Estimated authorized IBM Reseller Price for model 2626-20U. Actual prices may vary. MHz denotes microprocessor internal clock speed only; other factors may also affect application performance. GB=billion bytes when referring to HDD capacity. PCs referenced in this ad include an operating system. IBM product names are trademarks of International Business Machines Corporation. Intel Inside and Pentium are registered trademarks of Intel Corporation. © 1998 IBM Corp. All rights reserved.

RULES? WHAT RULES.



INTRODUCING THE IBM THINKPAD® 390 SERIES

Who said notebook computers were just for the big budget guys? The ThinkPad 390 gives small business professionals a fully integrated desktop alternative at a small business price. It's got a huge active matrix screen, a built-in CD-ROM and floppy, high-performance stereo speakers, and a keyboard so roomy you forget it's a notebook. All the power you need. All at a price you can handle. See the full line of ThinkPads at www.ibm.com/thinkpad or call 1 800 426 7255, ext. 5020.

 e-business tools

Intel® processors (up to 266 MHz) / Up to 4.3GB hard drive / 12.1" or 14.1" screen / CD-ROM / From \$1,799

Gold Rush

EVEN THOUGH THE DOW IS DOWN ALMOST 1,000 POINTS FROM its July high, the Internet economy is doing well. A case in point is eBay, the world's leading personal trading community.

Utilizing the Internet, eBay has created a new market for one-to-one trading of goods using an auction format. eBay went public on Sept. 24 at \$18 a share. As of this writing, eBay hit \$71 a share, giving it a market cap of approximately \$2.8 billion. Not bad for a company forecast to lose money this year.

What is Wall Street seeing and buying? In my opinion, the future. To be specific, the Internet future. eBay is creating a new market that combines many key attributes of the best Internet companies: content (created by users), commerce, community, unprecedented broad-based links between

buyers and sellers of goods, and perhaps most important, fun and entertainment.

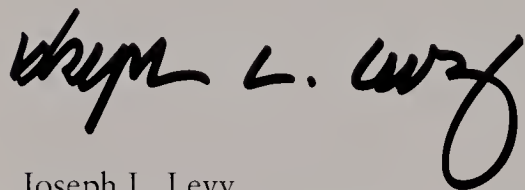
But is it worth almost \$3 billion? Yes, especially once you realize that we've only begun to tap into the Internet economy. According to Morgan Stanley, PC unit shipments may grow from 71 million in 1996 to 130 million in 2000. The number of PC users should climb from 167 million in 1996 to 269 million in 2000. Internet users will climb from 17 percent of PC users in 1996 to 58 percent in 2000, translating as 157 million Internet users. That's a lot of prospects.

eBay is not alone in riding the Internet wave. It's interesting to note

that of the top 10 Internet companies, in terms of market cap, only Yahoo is profitable on an annualized basis. The combined value of the top 10 is a staggering \$31 billion as of Oct. 6, 1998.

Naturally, stock prices can fall as well as rise. But I wouldn't bet against eBay because of its first-mover advantage and scale. More than 23 million items have been for sale on eBay since its inception in 1995. Currently, more than 720,000 items are for sale in over 1,000 categories. Achieving this kind of volume is unprecedented. No other company is even close.

What is your organization doing to prosper via the Web? Is your technology infrastructure ready to take advantage of the Internet economy? What's your opinion? As always, I appreciate your thoughts and comments.



Joseph L. Levy
President, CEO and Group Publisher
jlevy@cio.com

cio.com
<http://www.cio.com>

On Our Web Site

Analyst Corner

This new area presents the latest industry analysis from the research community.
www.cio.com/analyst

TalkBack

Read CIO's opinion on a variety of topics and then express your own in this new format.
www.cio.com/CIO

Discussion Areas

Our knowledgeable readers discuss a wide range of topics—the next big wave, career strategies, IT support models, knowledge management and more.
www.discuss.cio.com

How to Reach Us

E-mail: letters@cio.com

Phone: 508 872-0080

Fax: 508 879-7784

Address: CIO Communications Inc.,
492 Old Connecticut Path, P.O. Box
9208, Framingham, MA 01701-9208

Web Site: www.cio.com

Subscriber Services: 800 788-4605;

Fax: 508 879-7899;

E-mail: denisep@cio.com

Reprints: Reprints are available by calling 508 935-4539.



SEND HELP

50% of the Fortune 500
SEND REMEDY.

More than 6,000 sites in
62 countries
SEND REMEDY.

For over 2,000,000 employees
who need help, the world's
largest corporations
SEND REMEDY.

Remedy Corporation, the world's leading provider of enterprise help desk solutions, is the best call to manage IT organizations world-wide. Remedy delivers unequalled ROI with comprehensive solutions that automate IT and many internal business processes—dramatically increasing employee productivity and customer satisfaction. See how much Remedy can help simplify your business processes at www.remedy.com.

 **Remedy**
Corporation



What, exactly,
is the best way to
share
a thought?

Do you post it on your Intranet? Or do you say it on the Internet? Should you e-mail it? Or fax it? With so many ways to connect, you need the help of a company that can help you unify them all – Nortel Networks™. A company whose solutions are at the heart of mission critical networks – ranging from the world's largest capital markets, to the world's busiest call centers. We've even connected entire countries through advanced wireless networks. For a few thoughts on how you can unify your networks, call us at 1-800-4NORTEL, or visit us at www.nortelnetworks.com.



How the world shares ideas.

THREADS

The Company Dime

THE THOUGHT OF putting the Internet's voluminous resources at the fingertips of employees makes a lot of companies nervous. It's too easy, they say, for workers to get sucked into the Internet's pages and fritter the work-day away. But it turns out some companies are actually turning to the Internet to reduce the time employees spend on personal matters during the workday.

"Most employees shop for auto insurance or mortgages during business hours," says

Gary Snowberger, a vice president at Atlanta-based Consumer Financial Network, better known as CFN (www.cfn.com).

"Companies want to make it easy for employees to shop for such services through a corporate intranet."

CFN helps them do that by providing many benefits and services that companies can offer to their employees via their intranets. In addition to mortgages and auto insurance, CFN sells products ranging from long-term care to home equity loans. CFN negotiates product offerings and prices with insurance and financial companies, so employers are spared the labor of working separately with different vendors. The service is free for employers; employees can often pay for policies—at group discount rates—through automatic payroll deductions administered by CFN. For its part, CFN earns its keep through commissions or fees paid by the partic-

ipating companies when a policy or product is sold.

Another company offering optional benefits through corporate intranets is Baltimore-based RewardsPlus of America Corp. (www.rewardsplus.com). Like CFN, RewardsPlus negotiates group discounts and administers payroll deductions at no cost to employers. Both CFN and RewardsPlus market the benefits programs directly to employees, eliminating much of the need for HR people to get the word out. As for the insurance companies, financial firms and other service providers that partner with CFN and RewardsPlus, Longwell says that they have a lot to love about the concept. "We can typically market our services five times to an employer for under \$3," says Frank Longwell, vice president of marketing. "A single direct mail package from a provider costs \$1.49."

—Megan Santosus



Growing Numbers

Of 302 companies surveyed...

93% have a Web page or a Web pilot program

81% offer companywide access to the Internet for business purposes

77% expect to sell more by using the Internet

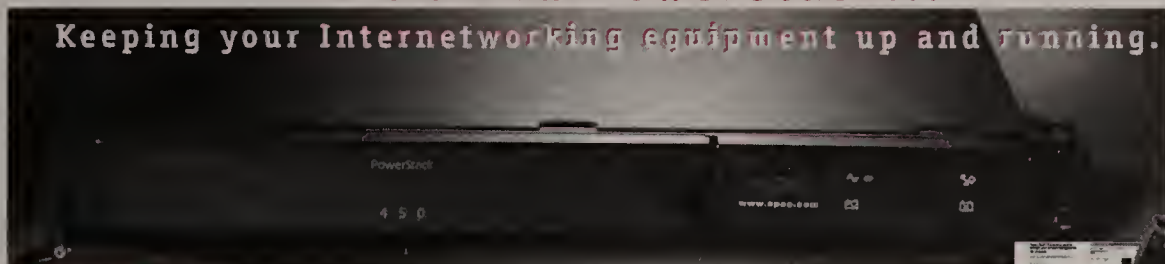
54% take orders over the Internet

0% 50% 100%

SOURCE: XPLORE INTERNATIONAL'S 1998 TECHNOLOGY DIRECTIONS SURVEY

APC's new PowerStack...

Keeping your Internetworking equipment up and running.



FREE! PowerStack Solutions Kit

Name: _____

Title: _____ Company: _____

Address: _____

City: _____ State: _____ Zip: _____ Ctry: _____

Phone: _____ Fax: _____

Brands of UPS used: _____

Brand of PCs used: _____

Brands of Servers used: _____

of UPSs used _____ # of PCs used _____ # of Servers used: _____

☐ **YES!** Please send my FREE Kit today.

☐ **NO,** I'm not interested at this time, but please add me to your quarterly newsletter mailing list.

<http://promo.apcc.com> KEY CODE
i279z
(888) 288-APCC x7423 • FAX: (401) 788-2797

APC®

AMERICAN POWER CONVERSION

©1998 APC. All Trademarks are the property of their owners. SU2J8EB-US E-mail: internetworking@apcc.com • 132 Fairgrounds Road, West Kingston, RI 02892 USA



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE



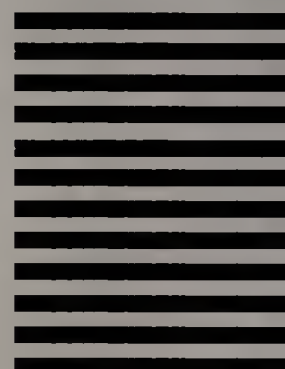
KEY CODE: i279z

Department: B

132 FAIRGROUNDS ROAD

PO BOX 278

WEST KINGSTON RI 02892-9920



If time is money... why isn't your network up and running all the time?

APC's new PowerStack™ keeps your internetworking equipment up and running through power disturbances.



If your network's job is to speed data from point A to point B, what happens when the power stumbles and fails while the trip is only half over? Bad packets, reset switches, downed hubs, irate users... the list goes on and gets uglier with every second of downtime. A server-based Uninterruptible Power Supply (UPS) protects only a small part of the data path, but now there's APC PowerStack, a UPS designed specifically for the places between your servers: hubs, routers, switches and bridges. Best of all, it's from the company that protects more networks than all others combined: APC.

Premium protection, without a space premium

Can this much power really come in a 1U package? Now internetworking reliability takes less space than you ever imagined. Whether stacked, on the desktop, or wall-mounted, APC PowerStack keeps your internetworking equipment up and running while maximizing valuable enclosure space.



New PowerStack is ideal for today's popular hubs, routers and switches, giving up to 40 minutes of runtime for a typical Ethernet Switch. Hit www.apcc.com to find out more.

In both 250VA and 450VA models, the new PowerStack includes PowerChute® plus power management software for Windows NT and Windows '95, so you'll always know what's up (or in trouble), so you can troubleshoot without users ever knowing.

Automatic voltage correction ideal for remote sites and wiring closets

APC PowerStack features intelligent voltage monitoring which corrects over and under-voltages without draining battery power. Whether your wiring closet is next to an elevator or a copy machine, PowerStack protects against the dips and sags local machinery creates. Have multiple outages in a short timespan? No problem. The APC PowerStack is always ready.

Four outlets of guaranteed protection

PowerStack has enough outlets to do the job, and a guarantee to prove it. Should bad power get through an APC PowerStack and cause damage, we'll cover it up to \$25,000. (see policy; US and Canada only)

User-replaceable and hot-swappable batteries

Once batteries reach the end of their useful life (3-6 years), you can swap them without downing your network. With APC replacement is quick, safe, and affordable, unlike brands that require factory replacement which leaves your network unprotected.

It's said there are two type of networks: those who have gone down due to a power glitch and those who are going to. With APC PowerStack you can join another group: those who have the peace of mind, protected uptime and reliability that comes with APC.

FREE!

PowerStack Solutions Kit.

A valuable set of tools to keep you up and running

Visit today!

<http://promo.apcc.com>

(888) 289-APCC x7423

KEY CODE i279z

APC
AMERICAN POWER CONVERSION



Save \$71 on Your Next New Car

IF THERE WAS ANY DOUBT ABOUT the usefulness of the Internet for EDI, it was quashed this fall with the advent of the Automotive Network Exchange, or ANX. ANX, a virtual private network for EDI developed by the Automotive Industry Action Group (AIAG), a trade association of vehicle manufacturers and suppliers, and Bell Communications Research Inc. of Morristown, N.J., went into preproduction mode in September and was scheduled to launch in full in November.

The payoff for Taylor Steel Inc. of Stoney Creek, Ontario, was immediately apparent. Taylor's data communications charges have dropped 70 percent since it began using the ANX to transmit EDI data to its two primary trading partners. Taylor, a steel processor that does half of its business with the auto industry, has also cut the time to process EDI data from these two partners from 35 to 15 minutes by switching to the ANX from an older Value Added Network (VAN).

That 20-minute savings is significant, says Paul Krikke, coordinator of IS business applications for Taylor. One of Taylor's two main suppliers, Dofasco Inc., a steel mill in Hamilton, Ontario, is just 15 minutes away. When Dofasco sends a truck from its loading platform to deliver an order to Taylor, it transmits an EDI message containing the properties of the steel in the truck. Previously, when the message was routed to the VAN, the truck arrived before the EDI message. That meant that Taylor would have to keep the delivery on the loading dock for

20 minutes until the message was processed. Until Taylor figured out where each portion of the shipment belonged based on its specifications denoted in EDI data, some of the company's cutting and processing machine lines would slow down.

Krikke says that by the end of 1998 at least half of his company's EDI traffic will be traveling over the ANX and he expects that automakers and scores of auto parts suppliers could enjoy savings like those at Taylor. Industry watchers predict that ANX might slash \$1 billion in auto industry costs per year. Even before the development of ANX, the AIAG itself had concluded that improved material and data flow would reduce the cost of cars and trucks an average of \$71.

Now, companies in other industries are clamoring to plug into the network—or start their own—according to reports in the trade journal *Automotive News*. The AIAG plans to give ANX access at some point to companies in other industries that do business with automakers' personnel, including banks, insurers and health-care organizations.

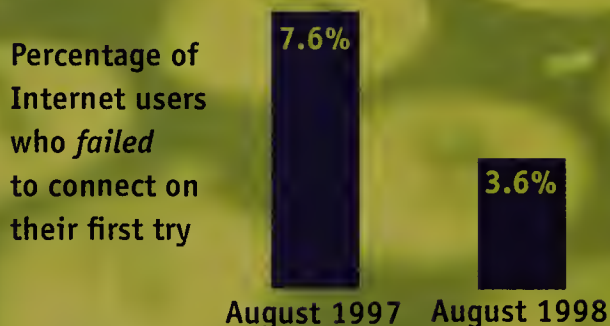
—Peter Fabris



STEELING MOMENTS: Paul Krikke of Taylor Steel says ANX knocks a 35-minute process down to 15 minutes.

A Little Better All the Time

Net gain in dial-up reliability



SOURCE: INVERSE NETWORK TECHNOLOGY INC. WWW.INVERSENET.COM (COMPANY TRACKS ISP DIAL-UP PERFORMANCE IN 42 U.S. METROPOLITAN AREAS.)

Brand-New Bag

One more thing the Web does faster than brick and mortar: establish brand.

According to a recent study by Opinion Research Corp. International of Princeton, N.J., seven Internet-related companies have names that are now recognized by at least 25 percent of the adult population of the United States.

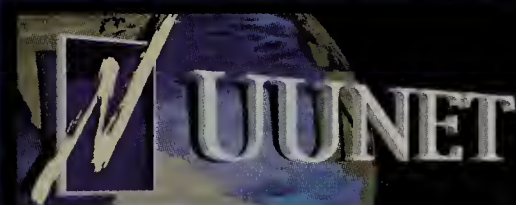
The seven winners are America Online Inc., Yahoo Inc., Netscape Communications Corp., Amazon.com Inc., Infoseek Corp., Excite Inc. and Priceline.com. Priceline's place among the winners is surprising on one hand because it built its brand recognition in just 150 days (the interval between its launch date and the date of the study) and not surprising on the other hand: It commissioned the study.

PHOTO ABOVE BY PATRICK NICHOLS

IT TAKES REAL BACKBONE TO GUARANTEE --- 100% SERVICE.

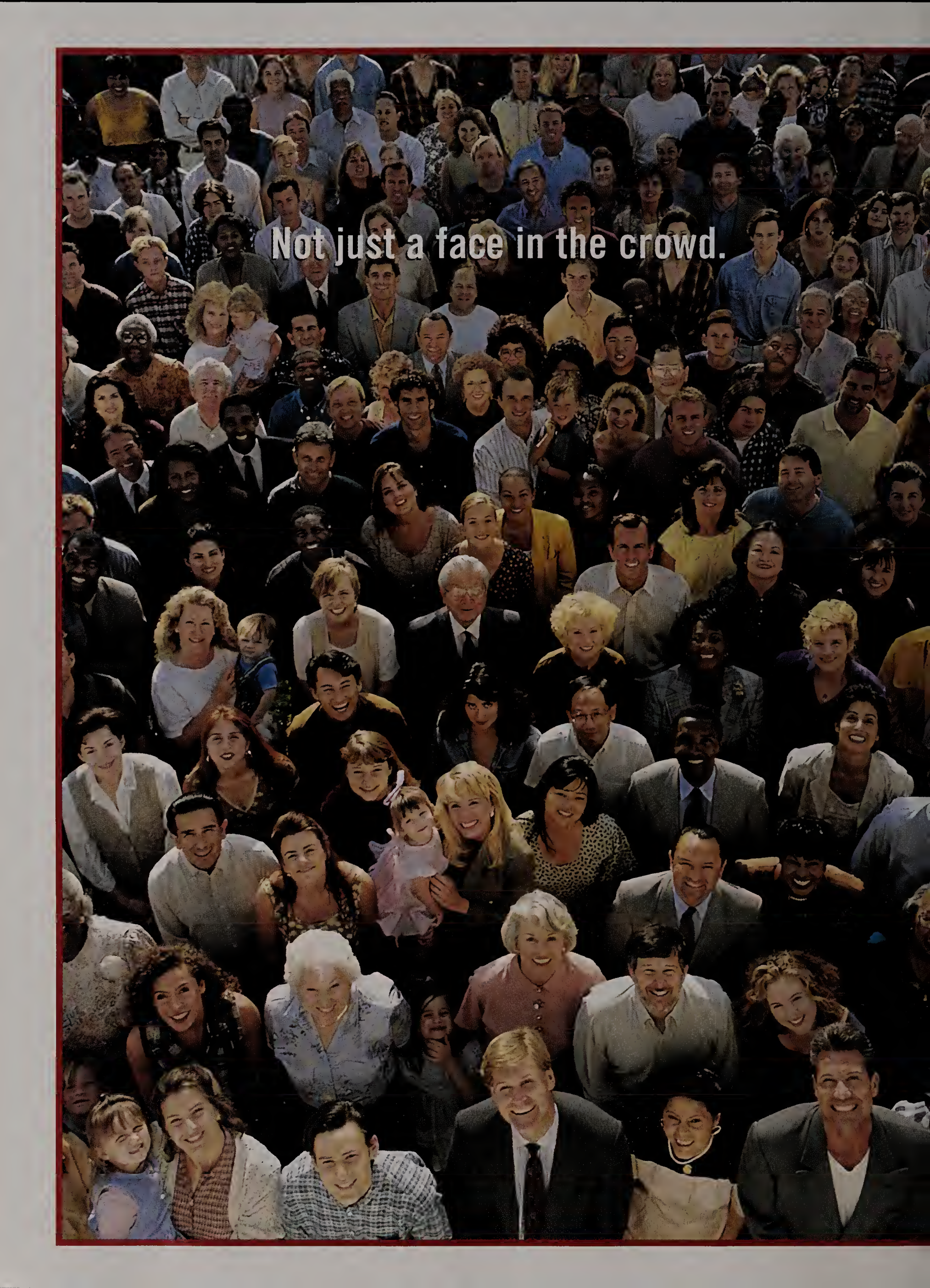
INTRODUCING THE FIRST 100% GUARANTEED INTERNET SERVICE.

Our new Service Level Agreement means guaranteed availability on dedicated US leased-line and frame relay connections, including 56 Kbps, T-1, T-3 and OC-3 access services, along with guaranteed latency rates and guaranteed 24-7 monitoring of your connections by our Network Operations professionals. In fact, we even guarantee that we'll promptly and proactively notify you of any problems and get your new connection installed when we say we will. So call 1 800 465 1794 or visit info.uu.net/first. Because, after all, guaranteeing service takes more than just backbone. It takes nerve. UUNET,[®] a WorldComSM Company. Uniting the world of business.*



AN MCI WORLD.COM COMPANY

U.S.: +703 206 5600 Canada: 1 888 242 0653 © 1998 UUNET Technologies, Inc., a subsidiary of WorldCom, Inc. All rights reserved. The UUNET logo is a trademark. * In the contiguous U.S.

A large, diverse crowd of people, including men, women, and children of various ages and ethnicities, are smiling and looking towards the camera. The crowd is densely packed, filling the entire frame. The text "Not just a face in the crowd." is overlaid in the upper-middle section of the image.

Not just a face in the crowd.

**“It’s an unsettling thought,
but if every other technology company in the
world mysteriously disappeared,
we could probably get by on NEC alone.”**

— *THE RED HERRING*

That’s because NEC’s expertise spans the computer, communications, imaging and semiconductor technologies that together make up the world of multimedia. Our ATM systems integrate voice, video and data so you can collaborate on just about any kind of project with colleagues just about anywhere. Our graphics accelerators give countless interactive games their turbocharged thrills. Our full-color, hand-held computers let you slip your office into your briefcase. Our new, flat panel monitors are delivering superior image quality from almost any angle. And our virtual microscopes are creating a whole new way to study the motions of molecules. Discover the world of multimedia. Because it’s your world. And NEC can help you run it.

www.nec.com 1.800.338.9549

**just imagine
NEC MULTIMEDIA**

NEC

Off the CyberShelf

Steal This Computer Book: What They Won't Tell You About the Internet

Wallace Wang, No Starch Press, 1998, \$19.95

ASSUMING THE DIALECTICAL INTERACTION OF Jekyll and Hyde, Wallace Wang invites us to the world of the brilliant scientist and the manipulative deviant—that is, the honest cybersurfer and the ruthless hacker. *Steal This Computer Book* looks into the minds of those who seek to destroy your hard drive, describes how it is done and suggests how to protect your network from untimely demise.

Wang begins with a high-road overview of all the World Wide Web has to offer: Citing useful Web sites, he implores us to seek intelligent, firsthand sources to obtain news and information from around the world, broaden our horizons and get the “whole” story. With a dedication that speaks to truth, justice, honesty and the American way, Wang carries us through Part 1 with a feeling of purpose—we are on the road to knowledge. His philosophical banter makes his computer guide read like a novel.

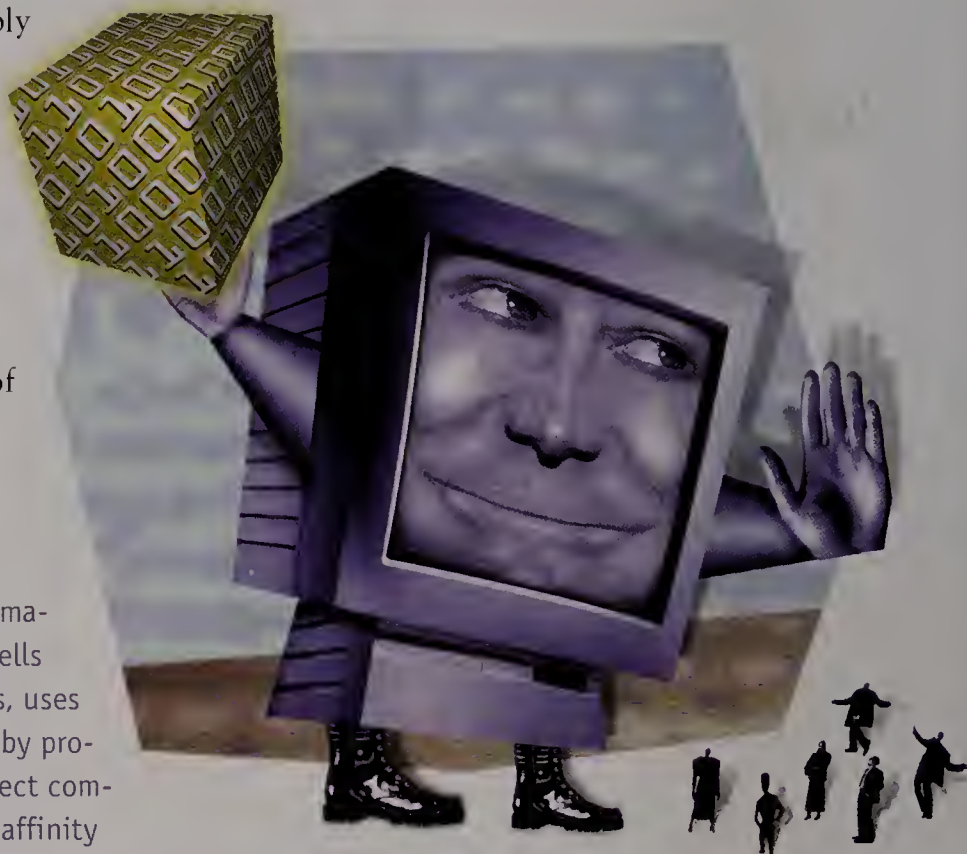
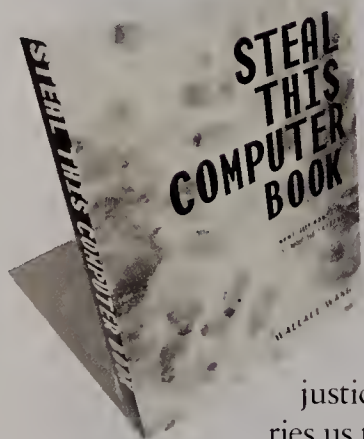
Part 2 teaches us how to buy computers cheaply and learn the benefits of used computers, floor models and building our own. He also shares the secrets of software piracy. Wang reminds us that once we have created an elaborate cyberkingdom we are immediately susceptible to hackers. To assist in protecting our network, he explains private and public encryption, anonymous remailers and the phone-phreaking phenomena. Hackers who employ this method of sabotage manipulate the telephone system to

make calls they will not have to pay for. Phone phreaking can be as simple as looking over people's shoulders to obtain their calling card number. For the more advanced hacker, it can include the rewiring of pay phones or telephone pole transmitters. Wang concludes this section, as he did the first, with information about how to access forbidden Web sites and literature with the goal of increasing our previously myopic worldview.

The concluding section follows the low road into the world of hackery and online warfare. We discover how to protect our children from demented surfers seeking to exploit their innocence. We get the lowdown on spam and how to avoid it; we learn how to find people on the Internet while avoiding being found. Wang ends with an in-depth explanation of viruses: how they are created, who is susceptible, how best to prepare for infection and what to do once the bug has spread.

Steal This Computer Book honestly assesses both the legal and illegal computer worlds. We can reconcile the Jekyll and Hyde tendencies within ourselves, understand that they exist in others and emerge better able to fight those who seek to destroy our networks.

—Kathleen S. Carr



Small Is Profitable

The Web allows businesses to sell to anyone anywhere with Internet access, but just because you can offer your wares to everybody, should you? Alan Snyder, president and CEO of Answer Financial Inc., which runs an insurance information and sales site, thinks not. Better, says Snyder, to choose your customers carefully and limit your service to the most lucrative segments of the market.

Snyder, whose Los Angeles-based company operates Insurance Answer Center (IAC; www.answercenter.com), a

service that offers information on insurance and sells policies from 55 carriers, uses the Internet to do that by providing employees of select companies and members of affinity groups password-protected access to his Web site.

IAC users have 24/7 access to licensed insurance agents over the Net and by phone. Agents offer advice and tailor automobile, home and life insurance policies as well as annuities for individuals. Snyder's company makes money the old-fashioned way: through

sales commissions.

Snyder says that limiting the customer base also helps keep Answer Financial costs down because it gives him tighter control of the volume of customer inquiries. Snyder contends that some Web sites have “profit-proofed” themselves by trying to do too much for too many.

—Peter Fabris

The IBM logo is a registered trademark and the IBM Business Partner emblem is a trademark of International Business Machines Corporation and are used together under license. S/390 is a registered trademark of IBM Corp. © 1998 IBM Corp. Baan ERP is a product of the Baan Company and is licensed solely under Baan's license terms and conditions. IBM and Baan are separate companies and each is responsible for its own products. Neither IBM nor Baan makes any warranties, expressed or implied, concerning the other's products, including any warranties of best 24x7 support.

INTRODUCING A PARTNERSHIP MADE FOR MANUFACTURING.

Manufacturing places special demands on ERP applications and the servers that run them. Fortunately, you can now run BaanERP software on the IBM® S/390®, creating a powerhouse for integrating and managing global operations with true flexibility. Virtually zero downtime. And a seamless, rapid implementation.

The combination of BaanERP on S/390 also allows you to leverage your existing investment in S/390 infrastructure, helping reduce the overall cost of ownership. Lower costs, in turn, can lead to increased profitability, giving your company a distinct competitive edge in today's fast-moving global economy.

BaanERP and the IBM S/390. The solution that can make a difference on your production line—and your bottom line—at the same time. Call 1-888-657-5868 or visit www.baan.com/IBMS390 for more information today.

Baan

IBM

Business
Partner

Holt Everything

HOLT EDUCATIONAL OUTLET, A DISCOUNT educational toy and teachers' supplies retail and catalog chain based in Waltham, Mass., has been enjoying some of the benefits—and learning about some of the consequences—of Web-based commerce. Holt CEO David Lord says the company expects to do \$15 million in business over its Web site (www.holtoutlet.com) this fiscal year (from June 1998 through June 1999)—not bad for a company that was doing around \$6 million in sales a year before it launched its Web site in 1997.

Holt has found that Web orders cost less to process than non-Web orders (50 cents per transaction over the Web, compared with \$2.25 per transaction for non-Web store and

catalog sales). Tight back-end integration of the Web site with inventory and financial systems has been key to the Web site's success, but it has also led to an interesting sales dilemma.

One day, Lord recalls, a customer bought 40 Kooshes over the Web, requesting second-day delivery. The inventory system showed 20 in the warehouse and 20 on the shelf in the real-world retail store, so the site allocated all the stock for the Web sale. But soon after, another customer walked into the store, picked up 9 of the 20 Kooshes and brought them to the register, raising a system red flag. How did Holt handle it? The in-store customer got the in-store Kooshes—and Holt got on the phone with the Koosh manufacturer. To avoid having to deplete the in-house stock, Holt had the manufacturer ship three 12-packs of Kooshes directly to the Web customer and Holt shipped four more to fill out the order.

"We can't turn away any customer," Lord says, online or in person. —S. Kalin

DOWN IN FLAMES

“The DMA's attitude is to spam the consumers until they scream, and that's not the way things are done in cyberspace.”

—Jason Catlett, president of Junkbusters Corp., commenting on the Direct Marketing Association's acquisition of the Association of Interactive Media

Spam Gain Without Pain

If your company decides that bulk commercial e-mail is part of your marketing plan, it is a good idea to follow the advice below:

- 1 Find out if there are any specific spam mail restrictions in your state and in the states where your customers live.
- 2 Purchase a list from a reputable company. Several companies now regularly compile lists of e-mail addresses. Ask the company how it goes about compiling its list. Does it have lists to match a specific interest or market? Does it guarantee a set number of responses?
- 3 Make sure that your e-mail includes a "remove" message that allows recipients to ask to be taken off the list. If a recipient requests to be taken off the list, make sure that happens in a timely fashion.
- 4 Do not use false or third-party headers. Nearly all laws being debated require that the parties sending the commercial e-mail must correctly identify themselves.
- 5 Be upfront about what the product or service is, its potential benefits and associated costs.
- 6 Establish a refund policy that allows consumers to return a product or service within a set number of days. Make sure that the refund policy is clearly stated in the message.

—Suzanne A. Smith and Emily Woodson Davis

Without Requirements Management

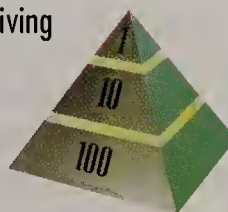


With RequisiteProTM



RequisitePro helps you gain control of all your project requirements. Deeply integrated with Microsoft® Word, RequisitePro manages all requirements-related documents and data, giving your team the ability to deliver on-time, on-budget and on-target!

Find out why Rational's RequisitePro is the industry's most popular requirements management tool. Visit our Web site to obtain a free evaluation of RequisitePro and for more information on how to ensure the success of your development project.



Call 1-800-728-1212

RATIONAL
SOFTWARE

www.rational.com/ducksinarow

Next-Generation Leader

A teenage entrepreneur launches an online sales-lead company and, perhaps, an empire

BY ANNE STUART

DAVID KORETZ DOESN'T BELIEVE IN THINKING small. He's shooting to be a billionaire, or at least a multimillionaire, by his 25th birthday. He's got some wiggle room: He's just 19 now. Koretz is betting that, over the next six years, his emerging Web-based business, Network Marketing International LLC (NMI), will at least push him in the general direction of seven-digit Nirvana (although he insists it isn't the wealth he's after but a chance to prove himself as a businessman).

Whatever the motivation, he appears to be off to a good start. NMI Online (www.leadstoyou.com), which generates and distributes sales leads, currently employs 8 people; Koretz expects to hire at least 30 more by early 1999. NMI also secured a healthy injection of venture-capital funding from B. Thomas Golisano, CEO of the Rochester, N.Y., payroll-management company Paychex Inc. (www.paychex.com) and the 1998 Independence Party candidate for New York governor. Neither Golisano, whom Koretz met through a high school business class project, nor Koretz will disclose the amount of the investment, for which Golisano received a 50 percent share in the company.

Growing up in a family of entrepreneurs, Koretz has been interested in business since childhood. At age 7, he set up shop in his driveway to sell shells. By age 10, he'd developed an intense interest in the stock market, says Koretz, whose parents own a Rochester collection agency. It wasn't long before he was starting his own companies.

www.leadstoyou.com

NMI is actually his third business. His first, Compucepts, which he founded at age 14 as a computer-repair service, evolved into an international electronics-distribution firm. He launched the second, a Web-site development company called Webvertisements, as a high school senior. A year ago, Koretz shut down Compucepts (which he called "a good educational experience," if never highly profitable) and sold Webvertisements to his partner in order to focus

on NMI. He also put his college career on hold, taking a leave of absence from the business program at Babson College in Wellesley, Mass., during his freshman year. "For right now, business is pushing the pace of my education a lot faster than I can do at any school," says Koretz, one day after buying himself a '94 BMW.

In creating NMI, Koretz initially planned to publish a magazine with regional leads for salespeople. But he soon realized that information had a shelf life too short for paper: "It becomes outdated almost the second you get it." By offering leads online, he figured, he could not only provide information faster, he could customize it.

"Not only have we reduced the cycle from a week to a minute, the customers can actually specify the criteria they want to search by," says the high-energy Koretz, who routinely puts in 100-hour workweeks and who, when responding affirmatively to a question, tends to answer "Absolutely!" or "Definitely!" rather than just "Yes." What's more, Koretz explains, "You can go online and, step by step, further define or further broaden your criteria to buy exactly the kind of information you'd like." For example, say a sales team has a \$1,000 budget to buy leads, but an initial pass on NMI turns up \$5,000 in leads. The team can narrow its search by adding specific criteria, such as geographical criteria or type of industry, until it gets the number of leads to be purchased down to that \$1,000 limit.

Where does NMI find its data? Primarily from about 4,000 telephone Yellow Pages directories. The company also compiles information from business filings in local government offices nationwide and from other databases. All that information goes into NMI's sales-leads database, which customers pay to search. Currently, NMI serves three major market segments. Small businesses can purchase information directly from NMI's Web site, paying by credit card (average sale: \$200). Contract customers, mostly major corporations or organizations, pay



RIDING HIGH: David Koretz says sales reps' insatiable demand for new customers drives his success in marketing sales leads online.

\$25,000 to \$50,000 a year for customized search interfaces. Finally, NMI's broker program allows businesses and individuals to market NMI sales leads through their own Web sites.

NMI is focusing on that second market segment, contract customers who can specify exactly what type of criteria their employees use in searching the database for sales leads. Current customers include the United Way of Greater Rochester, which uses the system to search for businesses likely to contribute money, services or products (like a golf club manufacturer that might donate equipment for a charity golf tournament). NMI also allows contract companies to monitor and measure who's selling what and how well. If, for example, a few sales reps have been breaking all records, their managers could examine how the champs get leads, then share their secrets with the whole team.

In addition, NMI offers what it claims is the Web's only online sales-lead searching compatible with the federal govern-

ment's North American Industry Classification System (NAICS), which went into effect last year, replacing the U.S., Canadian and Mexican Standard Industrial Classification (SIC) codes long used by business-to-business marketers to tag and target industries. The U.S. government is gradually phasing in NAICS between now and 2002.

"That is a huge deal," Koretz says. "Companies are going to need to transform their own internal databases to NAICS-compliant systems." Because of the massive amount of software NMI created for its own internal NAICS conversion, NMI can essentially do the job for other companies.

NMI's latest project, launched in August 1998, is Persephone, an Internet data-mining product. Named for the daughter of the Greek goddess of the harvest, Persephone is a series of computer programs that scour millions of Web sites daily for business URLs, e-mail addresses and company data, which it uses to

update and expand on the listings in NMI's 15 million-record database. Persephone adds to existing information multiple contacts and department listings for each company as well as hours of operation, sales volume, number of employees and other information that Koretz says isn't available elsewhere.

Industrywide response rate to unsolicited sales pitches is about 1 percent, which Koretz calls unacceptable: "We do not want anybody who works with us to be using a shotgun approach; they should be using a rifle." In other words, by taking precise aim at a well-defined target, companies should be able to hit the bull's eye "10, 15, 20 percent of the time," Koretz says.

Right now, NMI is the tiny player in a huge market, competing with three publicly held information giants: Acxiom Corp. of Conway, Ark., InfoUSA Inc. of Omaha, Neb., and The Dun & Bradstreet Corp. of Murray Hill, N.J. Koretz says NMI's differentiating factor is that it provides more comprehensive information, updated more frequently and distributed over the Internet.

Despite Koretz's enthusiasm, not everyone is convinced that NMI will become the king of the sales-lead market. "I suspect there's less there than meets the eye," says Jim Nail, senior analyst at Cambridge, Mass.-based Forrester Research Inc. (www.forrester.com). "They're not distributing leads, they're distributing names. Anybody can do that." He praises NMI's unique data-mining techniques, but adds that it isn't clear which information is gathered that way and which comes from the old-fashioned methods such as culling names from phone directories.

Nail also praises NMI for attracting an unusually broad audience: "They seem to be appealing to everyone from the manager of the local Mail Boxes Etc. all the way up to a Forrester-size business or maybe even the local rep for Xerox who's looking for some leads" delivered quickly for a relatively low rate. "One of the tag lines we use is 'Instant delivery, lower prices, better quality information,'" Koretz says. "Those are the three things that really sum up what our company is all about." **CIO**

Managing Editor Anne Stuart can be reached at astuart@cio.com.

THE MAIN ATTRACTION

Branding Tall

Is your business positioned to be top-of-mind in the age of the Web?

BY SCOTT KIRSNER

Pencils out! Books closed! It's time for a pop quiz....

1. What color do you think of when you think of IBM?
2. What animal comes to mind when you hear the word cigarette?
3. What food do you associate with Aunt Jemima?

IF YOU ANSWERED BLUE, A CAMEL AND PANCAKES, CONGRATULATIONS: You've been imprinted. International Business Machines Corp., R.J. Reynolds Tobacco Co. and Aurora Foods Inc. have burned their brands into your brain, thanks to years of repetitive advertising. ("I'd walk a mile for a Camel.") Branding, for these old-line companies, meant sending out endless visual and textual messages to the consumers of the world, all in the hope of generating a positive aura around their products.

Branding on the Web means something entirely different. Understanding the difference and acting on it will separate the dominant brands in a given category from the also-rans. Offline, branding is about crafting a careful image that potential buyers then passively consume. Online, branding is about an experience. And it's active. Look at the two best-known brands on the Web: Yahoo and Amazon.com.

Yahoo Inc. made its name by providing a friendly, easy-to-use navigation service. It didn't need to spend millions getting you to associate a color, catch-phrase or character with its service. Yahoo simply civilized the wilds of the Web, and users flocked to it as a result.

Similarly, Amazon.com Inc. offered a gentle introduction to the world of electronic commerce. Put a book in your shopping cart, head for the register and *voila!* there it is at your door a few days later. The experience was so painless and convenient

that users became brand-loyal.

Nick Rothenberg, a managing partner at the Los Angeles offices of Reinvent Communications Inc., says it best: "Branding isn't just about image anymore. Everything you do online is part of the brand-building experience."

That said, here are my six cardinal rules for building a winning brand on the Web.

1. Leverage real-world brand equity.

Web users want to do business with brands they trust. Your site should highlight its relationship to your real-world business and your real-world brand. When United Parcel Service of America Inc. launched its Web site in 1994, it didn't create the "Big Brown Truck" Web site or "ShippingOnline.com." It constructed a presence at www.ups.com that simply transitioned a powerful real-world brand into a new medium.

"What our brand has come to stand for is reliability, security and global reach," says Dale Hayes, the company's vice president for electronic commerce marketing. "We didn't...reposition or reshape the brand on the Net. Our customers want to know that the same integrity they expect from us in the physical world is there in the virtual world."

Maximizing the value of an established brand on the Web also means being true to that brand. In the early days, when everyone assumed that the Web's most dedicated users were all between the ages of 15 and 29, sites strove to be hip and irreverent. Pandering—and brand mutation—was excusable at the time, but as the Web evolved into a mainstream medium, it became laughable.

"If your brand is hip, then make the Web site hip," advises Chris Enock, creative director at Enock Inc., a Manhattan design and development firm that has done work for such brands as Pepsi, Nasdaq and TWA. "If it's not hip, then the site will go against the grain of what you do. This is 1998, and not everyone on the Web is a skateboarder anymore."



**SOME COMPANIES THINK THEY CAN SELL
YOU AN HRMS
THAT'LL TAKE AN
ARMY
OF CONSULTANTS
YEARS
TO IMPLEMENT.**

They must be *soft.*

Best![®]

**INTRODUCING BEST! IMPERATIV HRMS.[™]
HR SOFTWARE WITHOUT THE ENTOURAGE.**

There are a lot of HR management systems out there. What's hard is finding one you can implement using the people, skills and infrastructure you already have in place. Presenting Best! Imperativ HRMS. It has all the features the HR department wants without all the extras you don't — like extra consultants, extra costs and extra time needed to implement.

And because it's based on Microsoft[®] BackOffice[™], it'll be up and running in weeks (not years). On top of that,

it's web-based so it's simple for users to learn, and simple for you to distribute to every workstation. Add to that Y2K compatibility and electronic software distribution for upgrading, and you've got yourself a comprehensive HRMS on schedule and within budget. All from a company with over 16 years experience and more than 40,000 customers worldwide. To find out more information, please contact Best Software.

1-800-368-2499

www.bestsoftware.com/army

2. Offer utility über alles.

Web brands are all about utility.

So what unique functionality do you offer? How does your site make customers' lives easier? UPS delivers value by letting visitors to its site find drop-off locations, calculate shipping costs and track packages en route. Borders.com employs human beings to help online shoppers find the books they're looking for by e-mail ("the author's last name rhymes with rutabaga").

"Building a brand in this medium is all about substance," says Jason Roberts, president and CEO of Sausalito, Calif.-based Panmedia Corp. "People want Web sites to be useful. If you're fulfilling a real need, and you have an honest connection to the audience, then you're bound to do something good."

3. Harness digital word-of-mouth.

I'm all for promoting a Web site offline. Autobytel.com Inc. made a giant leap in consumer awareness when it bought its first Super Bowl commercial, and Amazon.com became familiar to book lovers by filling the pages of *The New York Times Book Review* with prominent ads. But the real miracle of the Web is hive marketing: digital word-of-mouth.

Amar Goel started Chip Shot Golf Corp. in his dorm room at Harvard University in 1995. The brand was new, and his marketing budget for the company, which sells customized golf clubs over the Web, was almost nonexistent. But as an avid golfer, Goel knew that most of his fellow duffers first hear about new retailers and new equipment through word-of-mouth.

So he created a referral program on the site. You order a club from Chip Shot—say, a custom-built Big Bertha look-alike—and you get a discount code. When you give that discount code to any of your friends, they're entitled to a 5 percent discount. And when your friends buy from the site, you get 10 percent of the revenue—credit or cash—from those transactions.

Today 23 percent of Chip Shot's business comes from repeat customers, and 10 percent comes from referrals. The company's revenue—just \$8,000 a month in January—was up to \$60,000 a month when Goel graduated from Harvard in June and topped \$100,000 two months later. And the brand is on

its way to becoming the Amazon.com of the links.

4. Partner relentlessly.

A lot of old-line brands fail to understand that partners are everything in this medium. You can achieve critical mass much more quickly by joining up with other strong brands. For example, UPS allows

third-party sites to download its package-tracking feature, so some big customers like Gateway 2000 Inc., Dell Computer Corp. and Amazon.com have done just that. Chip Shot works with golf-oriented sites like GolfWeb, iGolf and golf.com to build its name recognition among fans of the sport. Alexa Internet, the company that developed Alexa, a new navigation tool that offers background information about the Web sites that you visit and suggests related sites, cut deals with Yahoo, VeriSign Inc., Britannica Inc. and Netscape Communications Corp.

"We're starting to get a lot of momentum from all these arrangements," says Darian Patchin, director of media and distribution at San Francisco-based Alexa. "We launched the service in beta in July last year, and we're already approaching a million and a half downloads. Partnerships were a huge part of getting to this point."

In short, never underestimate the impact of sharing content, swapping links, bartering for ad space, entering into comarketing agreements or partnering in other creative ways.

5. Protect your brand.

On the Web, your brand and your domain name are inextricably linked. Southwest Airlines Co. didn't realize this in 1994 when it registered Iflyswa.com ("I Fly SWA") to identify its online presence. Last year the company finally obtained Southwest.com. It's frustrating for customers when they can't find you easily and frustrating for you when they wind up at the Web site of an unrelated company (see what you get when you go to Delta.com).

Tom Barrett is vice president and general manager of Quincy, Mass.-based

Thomson & Thomson, which is marketing a new service called Namestake.com that helps clients establish and protect their online identities. "This is a high-stakes game," Barrett says. His advice: Register domains for every possible permutation of every one of your brands. (*The Boston Globe*, where I used to work, nailed Boston.com, Bostonglobe.

"Everything you do online is part of the brand-building experience."

—Nick Rothenberg

com and Globe.com but ignored Theglobe.com, which was later taken by another company.) If someone else has grabbed a domain you want, consider bartering for it, buying it, suing or waiting until the registration expires to nab it.

6. Listen to the customer.

There's simply no way that a Web brand can be useful and provide a rewarding experience without regularly asking its audience for feedback.

At Borders.com, users of the "preview" site that launched in May have been vocal in telling Scott Wilder, Borders Online Inc. director of Internet services, what they like and don't like. "We're very focused on how we can listen to their concerns and address them in features and functionality," Wilder says. Panmedia's Roberts estimates that users "suggest 90 percent of our tutorial topics nowadays." And at UPS, Hayes regularly enlists a research firm to survey customers: How does his site stack up against competitors like FedEx? What do consumers think about its performance, visual appeal, ease-of-use?

All three of these sites show an understanding that brand-building is no longer a one-way street. It's a two-lane highway, with traffic zipping in both directions. Your customers tell you what they want your brand to be, and you listen and react. After all, you're in this game to serve them—right?

Have I missed one of your cardinal rules for becoming a killer Web brand? Please clue me in. **CIO**

Scott Kirsner is a Boston-based writer and consultant. He can be reached at kirsner@worldnet.att.net.

Building an enterprise budgeting application



can be like going
to hell and back.

Deliver a solution fast with Comshare BudgetPLUS™ — the proven packaged budgeting application now available for your Oracle® database.

For once, the easy road is the best way. Comshare BudgetPLUS, with its single database, open architecture, and built-in intelligence, lets you deliver a robust, Web-enabled enterprise budgeting solution quickly and predictably. And it now runs on Oracle, as well as the leading multidimensional database. BudgetPLUS contains everything we've learned about enterprise budgeting applications —something we've been delivering for over 30 years.

So everyone who touches the budget gets exactly what they need to do their jobs—without keeping you from doing yours.

BudgetPLUS is one piece in the total Comshare finance solution. Our integrated portfolio of financial applications includes consolidation and reporting, budgeting, and performance measurement. Together, they help you support your growing and changing organization.

Save yourself with Comshare BudgetPLUS. Call 1.800.922.7979.
Register to win a FREE trip to Paradise Island at www.comshare.com/escape/
Prize includes airfare and a 4-night stay at the beautiful Atlantis Tower Hotel on Paradise Island, the Bahamas.

COMSHARE®

Is Spam Edible?

Sooner or later, every marketing person will be asked about sending unsolicited e-mail. Before answering, they should read this.

BY SUZANNE A. SMITH AND
EMILY WOODSON DAVIS

LET'S FACE IT—SPAM MAIL MAY BE THE MOST ANNOYING plague of the electronic age, but that won't stop advertisers from flooding networks with thousands of unsolicited messages. The term *spam mail* is rumored to come from a Monty Python sketch in which the word *spam* is repeated again and again, drowning out all other conversation in the room. It is an appropriate name, and the growing volume of spam now threatens to overwhelm and shut down ISPs.

In one case, it took an ISP over half a day to clean up the mess created by one mass mailing. ISPs have also lost users who close their accounts as a result of the burden of sifting through large numbers of unsolicited messages. Such consequences have led many users and ISPs to advocate a sort of vigilante justice by encouraging users to blacklist or "flame" online advertisers who employ spam mail tactics.

The bottom line, however, is that given the tremendous growth of the online community, reaching out to consumers via e-mail is often too tempting for merchants to resist. Chances are that sooner or later your employer or a client may ask you to help set up a bulk commercial e-mail operation or the obverse: to determine what can be done to dam the e-mail flood. So it's important that you understand the changing nature of regulations governing this form of marketing.

Private Regulation

Private regulation is now the primary means used to control the distribution of spam mail. From service agreements that prohibit users from sending spam to filtering systems that recognize and prevent the distribution of unsolicited e-mail to ISPs' users, ISPs continue to explore ways to stem the tide of unwanted ads. But these attempts have proved no match for spam abusers, who disguise the source and subject headers of their messages, making it difficult for ISPs to trace and eliminate spam from their systems. Additionally, ISPs face prohibitive costs for creating additional storage and bandwidth and hiring additional engineering and administrative staff to deal with the ever-increasing volume of unsolicited messages. Given the shortcomings of private regulation, it is not surprising that lobbying groups such as the Coalition Against Unsolicited Commercial Email (CAUCE) are pressuring state and federal legislatures to outlaw, or at least regulate, spam mail.

Government Regulation

Key questions in the spam debate are, Should spam be regulated or banned completely? Are certain spammers abusing a potentially useful sales tool?

Concern has also arisen that an emerging patchwork of state and federal laws

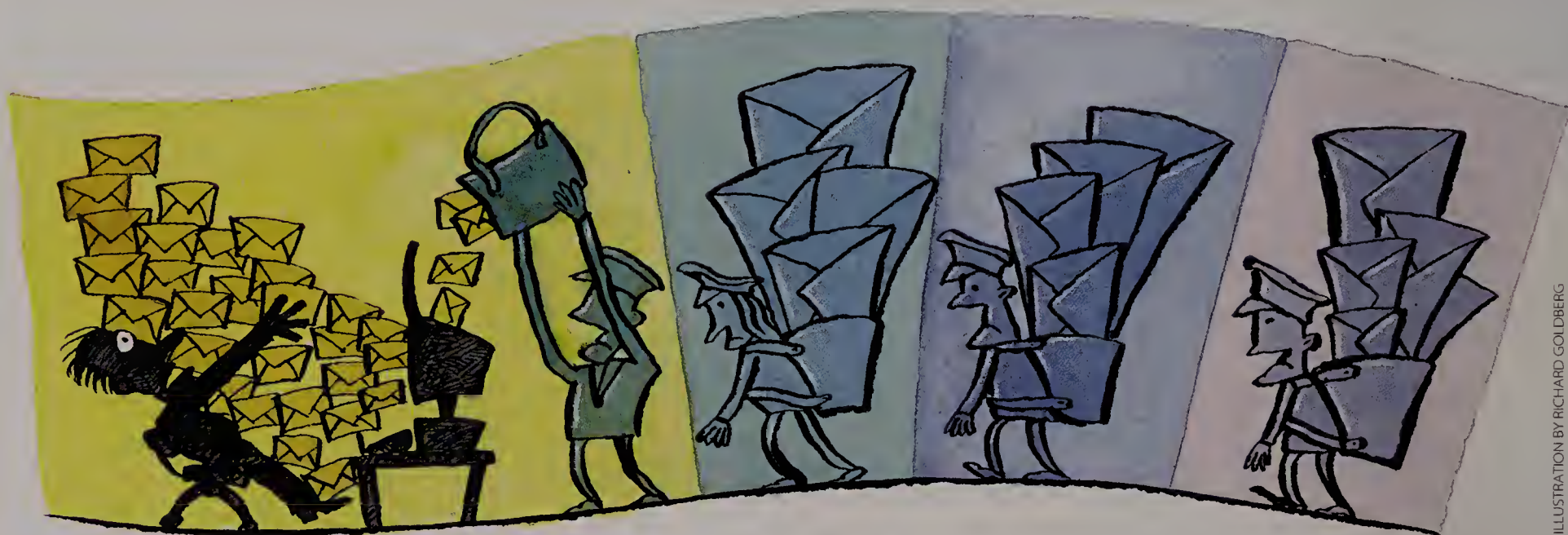


ILLUSTRATION BY RICHARD GOLDBERG

March 28-31, 1999
The Arizona Biltmore
Phoenix, Arizona

IT Triage

Managing in a State of Continuous Emergency



**Robert
Fulghum**

KEYNOTE PRESENTERS

**Nicholas
Negroponte**

To enroll, visit our Web site at www.cio.com/conferences or call 800 366-0246.

CIO Communications, Inc. • 492 Old Connecticut Path • Framingham, MA 01701

IT Triage: Managing in a State of Continuous Emergency

IT executives are assuming radical styles of human and information management and resource prioritization to meet the chaotic demands of the 21st century. Much like a battlefield triage surgeon, executives are increasingly forced to cut their losses and abandon otherwise important projects and systems to save those that are absolutely vital to the life of the entire enterprise.

While recently witnessing some of the largest winner-take-all business acquisitions and mergers in history, CIOs have repeatedly struggled to attract, retain and re-train competent IT staff, develop tenets of IS security to protect systems against sabotage, recover from crippling natural disasters, and diligently prepare for the most imposing and unavoidable IT deadline in history.

Although risks associated with each of these emergency situations have steadily increased, the timeframe to formulate sound contingency planning has proportionately shrunk. As a result, the predictable and proven methods no longer apply; and in order to preserve the sanctity of the enterprise, business and IT executives must be prepared to ad hoc evaluate, prioritize, juggle — or abandon — each critical situation in a constant state of readiness and often with extreme prejudice.

Will you be ready?

Using case studies, business briefings and presentations, leaders will consider how executives have successfully adapted to these

tumultuous events. By incorporating this knowledge into their business strategies, executives will be prepared to anticipate and meet the multi-faceted management demands of the 21st century.

*"Valuable
information sharing
combined with
peer networking
equals a good
investment
of my time."*

David Zaccagnini
Vice President,
Information Technology
The Polk Company



Keynote presenter **Nicholas Negroponte**, founder and director of MIT's Media Lab and author of *Being Digital* will discuss what we'll face in the digital future. Keynote presenter **Robert Fulghum**, author of *All I Really Need to Know I Learned in Kindergarten* and *Words I Wish I Wrote* will offer a humorous yet pensive approach to maintaining balance in one's life. **James C. Wetherbe, PhD** will once again moderate the conference.

During the General Sessions, **Joseph Morone**, president of Bentley College, will discuss new IT-driven curriculum within its MBA program. **Irene Dec**, vice president of information systems and Year 2000 program manager for Prudential Insurance Company, will explore the approaches and processes implemented at Prudential as a result of its Year 2000 project. The CIO of the Coast Guard, **George Naccara**, will discuss the CG's 21st Century IT management vision of providing seamless, instantaneous, secure and reliable information to support all CG missions.

To participate in **IT Triage: Managing in a State of Continuous Emergency**, visit our Web site at www.cio.com/conferences and enroll online or simply complete the enrollment form on the back of this brochure and fax it to 508 879-7720. You may also call our conference hotline at 800 366-0246.

CORPORATE HOSTS

ACXION

BUSINESS OBJECTS

Data General

EDS

epiphany

ERNST & YOUNG LLP

GTE

INTERNETWORKING
POWERED BY IBM

hp **HEWLETT
PACKARD**

LOCKHEED MARTIN

Lucent Technologies
Bell Labs Innovations



**NORTEL
NETWORKS**

**PLATINUM
TECHNOLOGY**

**Remedy
Corporation**

SEQUENT

KEYNOTE PRESENTERS



Nicholas Negroponte

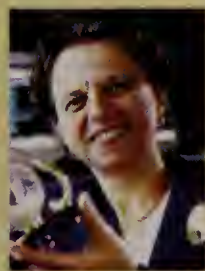
*Founder and Director
Media Laboratory
Massachusetts Institute
of Technology*



Robert Fulghum

*Author
All I Really Need to Know
I Learned in Kindergarten
and
Words I Wish I Wrote*

FEATURED PRESENTERS



Irene Dec

*Vice President
Information Systems and
Year 2000 Program Manager
Prudential Insurance Company
of America*



George Naccara

*CIO
U.S. Coast Guard*



Joseph Morone

*President
Bentley College*

CONFERENCE MODERATOR



James C. Wetherbe, PhD

*Director
MIS Research Center
University of Minnesota
Federal Express
Professor of Excellence
Director
Center for Cycle
Time Research
University of Memphis*



The Frank Lloyd Wright-influenced Arizona Biltmore balances modern comforts and glamour tempered with warmth. Two championship golf courses and the spectacular Paradise Pool offer the ultimate in relaxation.

Business Briefings

In addition to our general sessions, a series of business briefings will be provided on Monday and Tuesday by our Corporate Hosts.



Companion Program

Participation in the companion program includes all scheduled meals, receptions, entertainment, a stretch and tone class, and planned companion activities.

HYPERION
Driving Business Performance™



IDC

intel®

Stac

Sun
microsystems



VIDEO SERVER

To enroll CALL 800 366-0246,
visit our WEB SITE at www.cio.com/conferences
or FAX us at 508 879-7720.

ENROLLMENT FORM



IT Triage: Managing in a State of Continuous Emergency

March 28-31, 1999 • Arizona Biltmore • Phoenix, AZ

Please visit our **Web site** at www.cio.com/conferences or **Fax** to 508 879-7720. You may also **Call** us at 800 366-0246 or **Mail** the completed form to: Executive Programs, CIO Communications, Inc., D3620, Boston, MA 02241-3620.

NAME

TITLE

COMPANY

ADDRESS

MAIL STOP

CITY

STATE

ZIP CODE

PHONE

FAX

E-MAIL

COMPANY WEB SITE ADDRESS

WHAT IS YOUR INDUSTRY?

YOUR NAME AS YOU WANT IT TO APPEAR ON YOUR BADGE

HOTEL ARRIVAL DATE

HOTEL DEPARTURE DATE

NAME OF COMPANION (IF PARTICIPATING IN COMPANION PROGRAM)

CTD1

CHECK ALL THAT APPLY

ENROLLMENT FEES:

- ☐ **IS PRACTITIONERS/EXECUTIVES = \$1,995**
This fee applies if you are a CIO, IS executive or hold another executive position other than those listed below.
- ☐ **GOVERNMENT/MILITARY = \$2,655**
The fee includes your hotel for three nights. Do not make your own hotel reservations; CIO will make them for you.
- ☐ **SALES/MARKETING/CONSULTING = \$10,000**
This fee applies if you hold a sales, marketing, new business development or consulting position, including executive management of IT vendor and consulting companies. This fee is payable by company check only. CIO will make the final determination of this category.

OTHER ACTIVITIES:

- ☐ **COMPANION PROGRAM = \$325**
Companions must be enrolled in this program to attend any conference-related functions. Includes all scheduled meals, receptions, entertainment, companion breakfast, a stretch and tone class, and planned companion activities. Conference session attendance is not included.
- ☐ **I am not staying at the Arizona Biltmore**

Name of alternate hotel

PAYMENT INFORMATION: (Please make checks payable to CIO Communications, Inc.)

- ☐ Check Enclosed
- ☐ P.O. # (A complete purchase order must be submitted within 10 days) _____
- ☐ Credit card # _____
- ☐ AMEX ☐ VISA ☐ MC Exp. _____

Signature: _____

To enroll **CALL 800 366-0246**, visit our **WEB SITE** at www.cio.com/conferences or **FAX** us at 508 879-7720.

**Business
Card
REQUIRED
In Order To
Process
Registration**

ATTIRE

Casual! Please, no suits, ties or business attire!



HOTEL ACCOMMODATIONS

A block of rooms has been reserved at the Arizona Biltmore. We urge you to make your reservations early by calling the hotel at 602 955-6600 and identifying yourself as part of the CIO conference to receive the conference rate. CIO will make hotel reservations for government/military participants only. Be sure to guarantee your room with a credit card, as all unreserved or unguaranteed rooms will be released on February 28, 1999. Hotel reservations, cancellations and charges are your responsibility. If a CIO conference Enrollment Form is not received within 48 hours of making your hotel reservation, your room will be released from the CIO room block.

TRANSPORTATION

American Airlines is the official conference carrier. For discounted airfare, call 800 433-1790 and reference Star File #S5539UB. AVIS is the official car rental provider. Call AVIS at 800 331-1600 and reference B766657.

ENROLLMENT FEES

All enrollment fees must be paid in advance of the meeting. Fee includes conference sessions, business briefings, corporate host displays, conference materials and scheduled meals, receptions and entertainment. Transportation, hotel and recreation are your responsibility. Please note that submission of this enrollment form to CIO obligates the attendee/ sender for the enrollment fee.

CANCELLATION

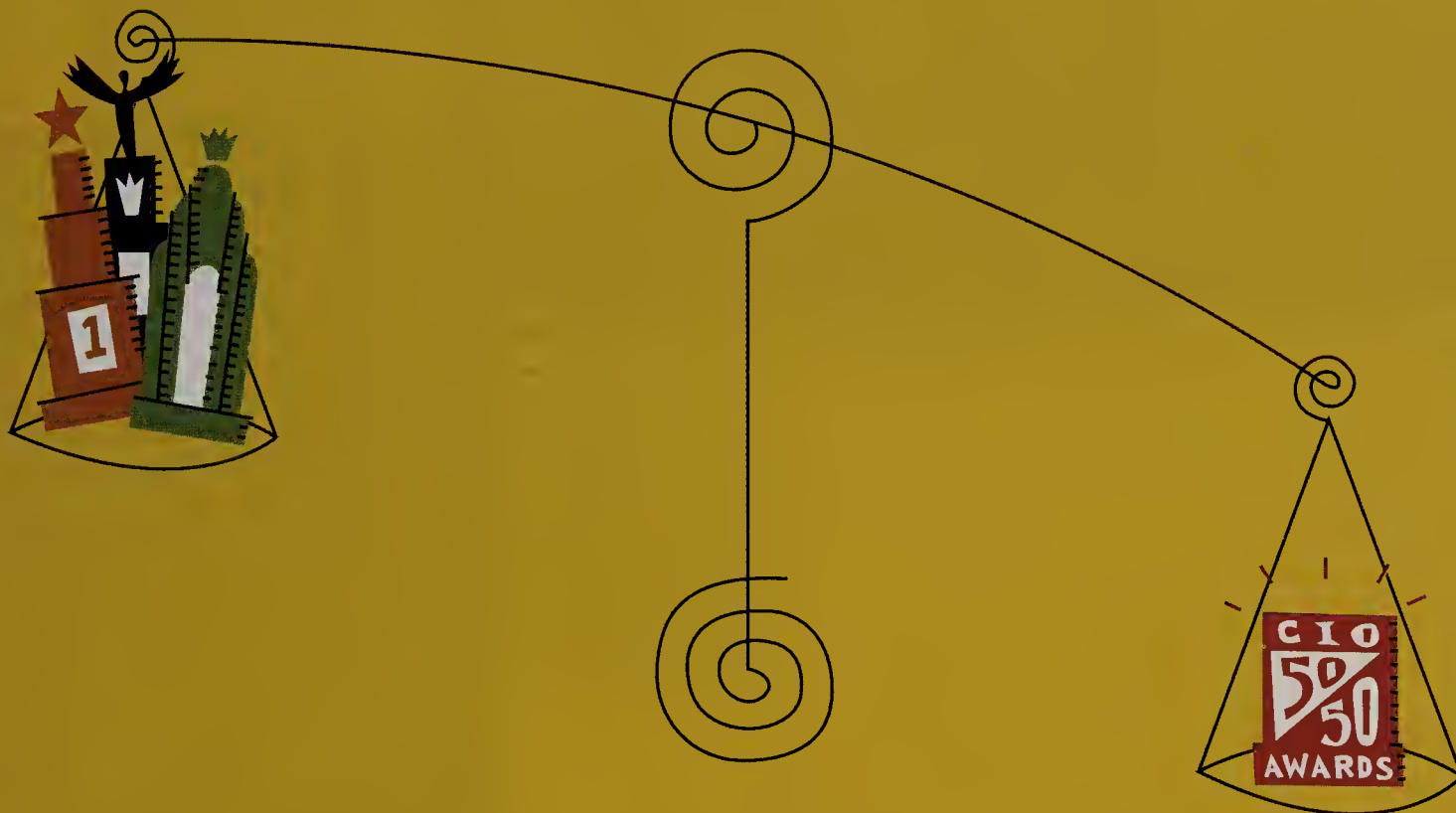
**ALL CANCELLATIONS OR
SUBSTITUTIONS MUST BE IN WRITING.**

You may cancel your conference or companion enrollment up to February 26, 1999 without penalty. A \$250 administration fee will be imposed for cancellations between February 26 – March 12, 1999. No refund or credit will be given for cancellations received after March 12, 1999 or for no shows. You may send a substitute in your place. CIO reserves the right to decline enrollment to any registrant.

A CALL FOR ENTRIES—The 3rd Annual

CIO Web Business 50/50

Not all Awards are Created Equal



Go For The Honor That Pulls Its Own WEIGHT

If your Web initiative is tied to a business objective and delivers real business value, then its time you got your taste of fame.

The CIO Web Business 50/50 recognizes 50 outstanding Internet and 50 outstanding intranet sites in the business, government and nonprofit arenas. The 100 winning Web sites will be featured in the July 1999 issue of CIO Web Business and at <http://webbusiness.cio.com>.

Tip the Scale in Your Favor

You can nominate an entire Web environment, a single site or a single application. We're calling for your entries. If you've got innovative design, technology, content or functionality, then we need to talk. Nominate your site online or contact Lisa Kerber at 508 935-4449 for more information.

CIO
WebBusiness
50/50

A Web Award with a Difference

<http://webbusiness.cio.com/50/50>

Entries accepted online until February 20th



Grows along with you.



Works as a team.

PLATINUM ProVision

Finally, there's one solution for managing your enterprise—desktops, applications, networks, databases and servers. Modular, so you can deploy what you need, when you need it. Featuring market-proven tools that work together—across platforms and your organization. Enabling your entire IT staff to collaborate and solve problems faster. So response times go down, service levels go up, and the future of IT management starts looking a whole lot brighter. See for yourself by visiting www.platinum.com/provision



Loves to run...ANYWHERE.

make **IT** shineTM

d a t a • s y s t e m s • a p p s

PLATINUM
TECHNOLOGY

will be incompatible with the interstate and worldwide nature of the Internet, presenting numerous jurisdictional and choice of law problems. For example, if the sender's state permits the sending of spam mail so long as the subject header is accurate, the receiver's state prohibits any spam mail and federal law permits spam mail so long as it is labeled as an advertisement, which law will govern if the receiver is upset at the spam mail? Will the federal law preempt the various state laws completely, or will preemption depend on which law is the most restrictive? Will the receiver be able to assert jurisdiction over the sender in order to force the sender to defend itself in a court in the receiver's state? Will the sender of spam mail need to comply with the restrictions in all three jurisdictions in order to be "safe"? (We recommend that advertisers do take that course of action until and unless the conflicts are sorted out.)

On the federal level, three bills are the most noteworthy in Congress. The Netizens Protection Act of 1997, sometimes known as the "Smith Bill," H.R. 1748, reflects the prohibition side of the debate and would amend the provisions of the Telephone Consumer Protection Act that prohibit the sending of unsolicited faxes to prohibit the sending of unsolicited e-mail as well. On the other side of the debate is the Electronic Mailbox Protection Act of 1997, proposed in the Senate as S. 875, which would permit the use of unsolicited commercial e-mail but would, among other things, prohibit the use of false headers such as invalid reply addresses and require senders of unsolicited commercial e-mail to honor opt-out requests. The third bill, the Unsolicited Commercial Electronic Mail Choice Act of 1997, proposed in and passed by the Senate as S. 771 and now pending in the House as H.R. 3888, also favors regulation over prohibition. Under the provisions of this bill, senders of unsolicited commercial e-mail would be permitted to send such messages provided each message is labeled as an advertisement and opt-out requests are honored. Furthermore, under the provisions, ISPs would be required to block out such marked messages upon request by their users.

At least 12 states have adopted or are considering legislation that would regulate the flow of unsolicited commercial e-mail. In June a bill became effective in

the state of Washington prohibiting false headers and misleading subject lines in unsolicited commercial e-mail messages originating in or sent to a Washington e-mail address and giving e-mail users a private right of action against advertisers sending such messages. However, the bill is not a blanket prohibition on the use of unsolicited commercial e-mail messages such as the bills pending in Connecticut, Massachusetts and Rhode Island or the bill enacted in Maryland, which would prohibit the use of unso-

olicited e-mail advertisements entirely. Other states are considering regulation legislation along the same lines as Washington but with different requirements. Alaska, for example, is considering a bill which would require unsolicited commercial e-mail to be clearly labeled as "advertisements," and a bill pending in California would provide ISPs with a private right of action against violators of their own published policies.

Is Commercial Speech Free Speech?

At the heart of the issue is the question of whether legislation restricting or prohibiting mass unsolicited commercial e-mail is a violation of the First Amendment freedom of speech. Traditionally, commercial speech has not been as highly protected as other types of speech. However, regulations on commercial speech are still subject to scrutiny by courts under the three-part test announced by the Supreme Court in *Central Hudson Gas & Electric Corp. v. Public Service Commission*, 447 U.S. 557 (1980). Under that test, commercial speech may be regulated if first, there is a substantial governmental interest in the regulation; second, the regulation directly and materially advances that interest; and third, the regulation is narrowly drawn. To date, no court has considered the issue of whether the government may prohibit the sending of unsolicited commercial e-mail. Interestingly, one court, in holding that an ISP could

block such messages from entering its system, stated that there is no right under the First Amendment to send unsolicited commercial e-mail to members of another ISP. However, the court did not address the question of whether a governmental prohibition would violate the First Amendment.

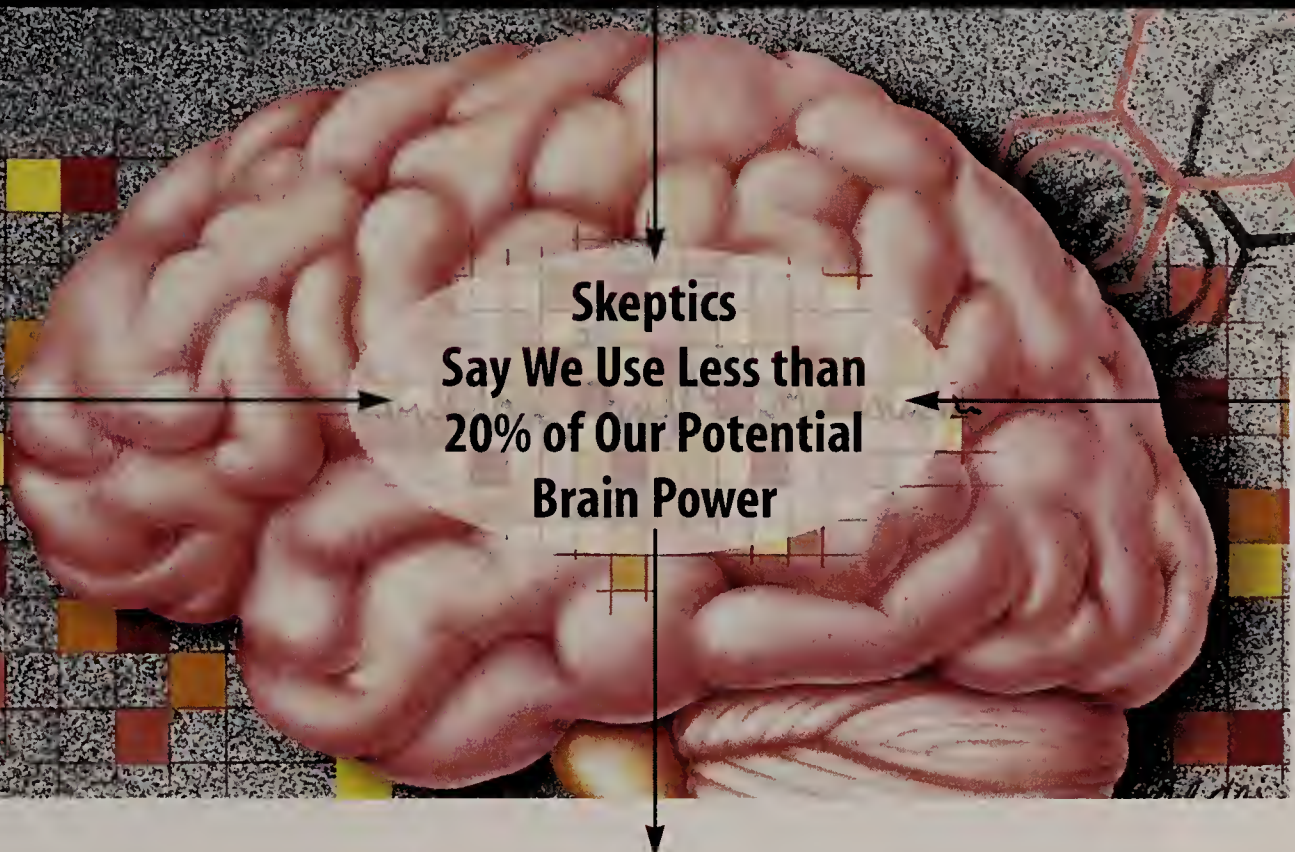
Some end users argue that unsolicited commercial e-mail should be treated the same as unsolicited commercial faxes. Prohibitions on unsolicited commercial faxes have passed scrutiny under the

At the heart of the issue is whether legislation restricting or prohibiting mass unsolicited commercial e-mail is a violation of the First Amendment.

Central Hudson test as regulations sufficiently tailored to further the substantial governmental interest in preventing cost shifting from the advertiser to the receiver of the unwanted fax. Proponents of this argument claim that unsolicited e-mail also results in such cost shifting and point to the fact that costs are passed on to ISPs in the form of increased system capacity costs, which are then further passed on to users in the form of increased rates. Opponents claim that the cost shifting resulting from unsolicited e-mail is minimal and does not approach the level involved with unsolicited faxes. Even if a court found that the amount of cost shifting involved with unsolicited e-mail would support a finding of a substantial governmental interest, a complete ban on spam mail is still unlikely given the availability of filtering systems, imperfect as they may be. It is also unlikely that certain of the proposed restrictions could be considered as directly and materially furthering the governmental interest.

For tips on how to use e-mail marketing without running afoul of the law see "Spam Gain Without Pain" in *Threads* (Page 24). 

Suzanne A. Smith is a partner at Preston, Gates & Ellis LLP, where she specializes in transactions and issues involving information technology. Emily Woodson Davis is a candidate for juris doctor at Harvard Law School.



**Skeptics
Say We Use Less than
20% of Our Potential
Brain Power**

"It occurred to me that I have paid consultants many times the cost of this software on many contracts throughout my career, and have received a lot less usable information."

Carol Naughton
Product Reviewer
SIGCAT Foundation

"Thanks to the validity of the information presented, the CIO ConsultWare Series IT strategy product has proven to be literally worth its weight in gold."

Edwin L. Martinez
Director, Management Info. Systems
Micro Optics Design Corporation

"With today's staffing challenges, this CIO ConsultWare product really belongs in the hands of IT executives everywhere. We may not be able to fix the IS staffing crisis, but at least with products like these, we can level the playing field considerably."

Angelo Privitera
CIO
HDR, Inc.

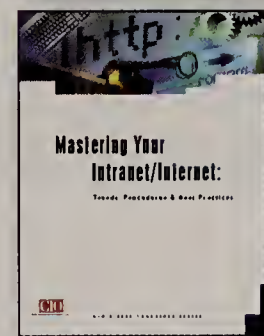
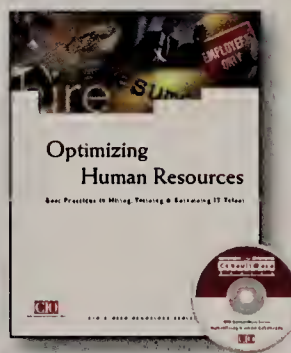
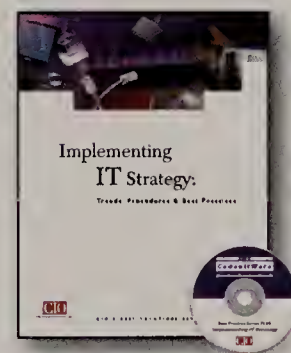
Imagine What's Possible if You Could Access the Rest...

Now it's possible to increase your knowledge base by accessing vast amounts of best practices, models and methods without ever leaving your desk—and within moments of when you need it. The authors of the CIO ConsultWare Series have filtered and aggregated key information so you use your time and resources wisely.

Packaged intellectual capital in the form of benchmarking reports and searchable CD-ROMs provides you with the knowledge you need on the critical technology management issues necessary to enhance your company's productivity and bottom line.

Topics currently available for purchase:

- ▶ **Implementing IT Strategy: Trends, Procedures & Best Practices** for \$2,295
- ▶ **Optimizing Human Resources: Best Practices in Hiring, Training & Retaining IT Talent** for \$1,995
- ▶ **Mastering Your Intranet/Internet: Policies, Procedures & Best Practices** for \$1,495
- ▶ **Managing IT Standards: Trends & Practices** for \$1,495



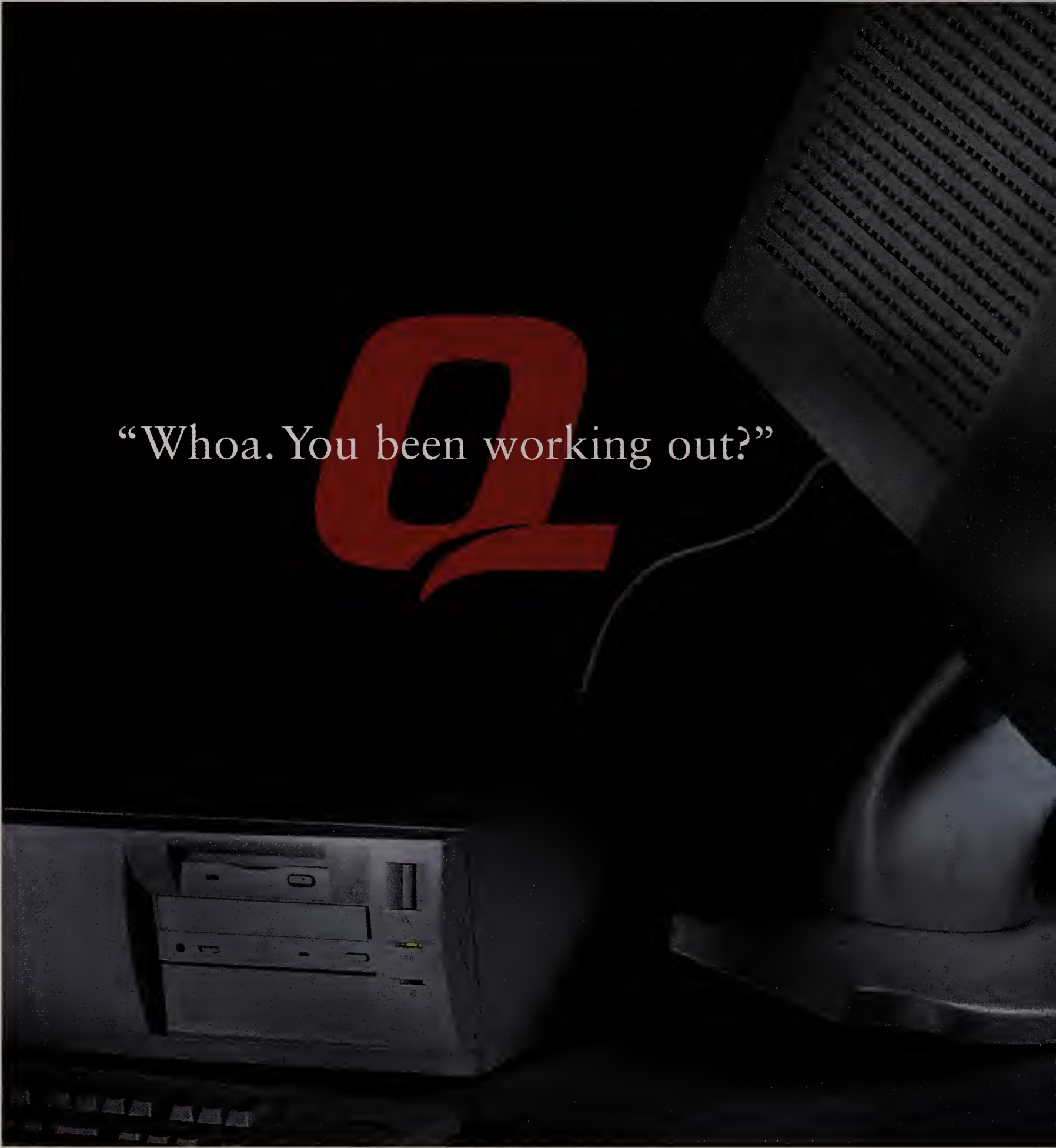
For more information or to download a demo, visit our Web site at www.cio.com/consultware.

To order any CIO ConsultWare Series research products, contact Dot Caspersen at 508 935-4040 or email your inquiry to research@cio.com.



CIO ConsultWare is produced jointly by CIO Communications and ICEX, an independent research firm.

THE CIO CONSULTWARE SERIES™ INTELLECTUAL CAPITAL THAT MAKES YOU THE EXPERT



“Whoa. You been working out?”

It's a head-turning combination: Compaq Armada 7000 Series notebooks have the muscle—Intel® Pentium®II processors up to 300 MHz—to run demanding, **COMPAQ** desktop-class software. Yet they're built for the road, with models featuring ultra-durable magnesium alloy casings. And they're loaded: displays

Better answers.SM



*For hard drives, GB = billion bytes. ©1998 Compaq Computer Corporation. All rights reserved. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corp. Compaq and the Compaq logo are registered trademarks. Armada is a trademark and Better answers is a service mark of Compaq Computer Corporation.

as big as 14.1". Hard drives up to 8GB*. Dazzling AGP graphics. Plus, they dock into our award-winning, highly expandable ArmadaStation or Tower Stand. For full-strength computing and full-tilt mobility, call us at 1-800-AT-COMPAQ. Or visit www.compaq.com/whoa.



Compaq Armada 7000 Series

NOT CHILD'S PLAY:

*eToys CEO Toby Lenk
left Disney to launch his
online toys company.*



Whoever Sells The Most Toys WINS

*eToys has the lead, Toys "R" Us has the brand.
Their online battle may determine which matters most.*

BY SARI KALIN



This year, Christmas will be different.

This year, online shoppers will begin to make a dent in the two-

Reader ROI

IN THIS STORY, READERS will learn

- ▶ The costs of playing catch-up online
- ▶ The hidden costs of online marketing
- ▶ What the Web can do that brick and mortar can't

month crush of gift-buying that gives toy merchants 40 percent of their yearly earnings. And for America's biggest toy merchant, the \$11 billion Toys "R" Us Inc., this year is a first too. It's the first year it has sold toys online. And the first time in decades that the 1,400 store chain has had to play catch-up.

In Santa Monica, Calif., 3,000 miles away from the Toys "R" Us Paramus, N.J., headquarters, a more practiced eToys Inc. is right in the middle of its second holiday season online.

Since its Web launch more than a year ago, eToys has been busy indeed. It bought out its largest Web-only competitor, Toys.com. It invested heavily in online promotion and distribution, including a \$3 million, two-year deal with America Online Inc. Its payroll has swelled to more than 100 people. This quarter it has begun rolling out its first-ever multi-million-dollar print and television advertising campaigns.

It has increased its inventory to nearly 6,000 items from almost 500 manufacturers—what it claims is a larger variety of in-stock toys than one would find on the shelves of a typical toy superstore. And it is expecting to do 15 to 20 times the business this Christmas than it did last Christmas.

Toys "R" Us and eToys have spent months redesigning their sites and millions of dollars priming for a marketing battle that is a case study classic: Web-only storefront takes on established king of big box retailing. On one side is a fast-moving company that started from scratch and is scrambling to boost its brand and make the most of its first-mover advantage. On the other is a slower-to-market giant that will try to take advantage of its brick-and-mortar legacy and its

well-known offline brand. They are battling for a slice of what Cambridge, Mass.-based Forrester Research Inc. expects to be at least \$21 million in online toy sales this year. That's only a fraction of the \$4.8 billion-plus Forrester is predicting for total consumer online sales this year—indeed, it is only a sliver of the \$20 billion-plus U.S. retail toy market according to Port Washington, N.Y.-based NPD Group Inc., a market research firm. Even so, it is a market segment that Toys "R" Us cannot ignore. "Internet sales could be big one day or not," says Ed Roth,

NPD's president of leisure activities. "But you can't afford not to play the game."

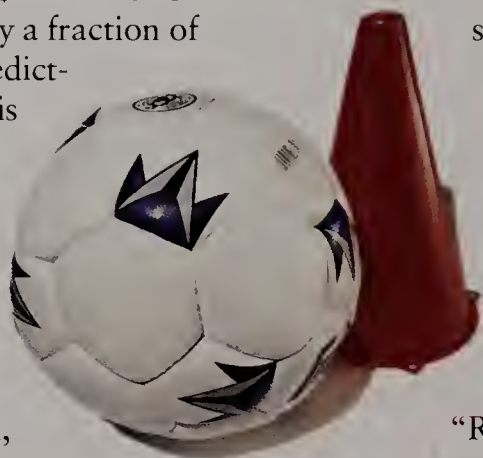
Toys "R" Us and eToys are, of course, not the only Web sites vying for toy shoppers' attention. Wal-Mart Stores Inc., which has eaten into the Toys "R" Us share of the U.S. retail toy market, beat both Toys "R" Us and eToys online and currently sells some of the most popular toys on its Web site. Upscale toy retailer F.A.O. Schwartz also sells over the Web; meanwhile, smaller players, such as Holt Educational Outlet, are carving out their own niches. Even toy manufacturers such as Hasbro Inc. are getting into the act, selling Interactive PC and video games directly to consumers. Despite the crowd, eToys' CEO Toby Lenk sees Toys "R" Us as his primary online competition. "It's really going to be a two-horse race at Christmas," Lenk says. "We hope to be number one."

How to Be a Pioneer

(and what to do if you're not)

Toys "R" Us execs claim that they made the decision to move from a brochure-ware Web site to an e-commerce one in February 1997—one month before Lenk, then a corporate VP in strategic planning for The Walt Disney Co., joined Knowledge Adventure founder Bill Gross to found eToys. Gross's Net start-up incubator, Idealab, gave eToys the seed money it needed. Lenk, who had no previous toy or retail experience, began building the site, aiming to offer a wide selection of toys and competitive prices along with useful interactive shopping features. By the end of September 1997, eToys had secured its initial round of private financing and was ready for launch, armed with promotion and distribution deals from the likes of Yahoo and America Online. At the same time, the e-commerce crew at Toys "R" Us was still developing its business plan. "The entire team working on the project at that point also had other jobs," says Debbie Kimball, Toys "R" Us general manager of electronic commerce.

Unlike eToys, Toys "R" Us outsourced whatever Web jobs it felt outsiders could do better and faster. Siegal and Gale, a New York City-based firm, designed the new Web site. Interworld supplied the e-commerce software. In-house staff did the systems integration work along with developing the fulfillment and customer service systems. And in February, Toys "R" Us decided to make out-of-store



AT A GLANCE

eToys

URL: www.etoys.com

Headquarters: Santa Monica, Calif.

CEO: Toby Lenk

Founded: March 1997

Revenues: Will not disclose

Employees: 100+

AT A GLANCE

Toys "R" Us

URL: www.toysrus.com

Headquarters: Paramus, N.J.

CEO: Robert Nakasone

Founded: 1948

Revenues: \$11 billion overall; will not disclose online revenues

Employees: 25,000 companywide, rising to more than 100,000 during the Q4 holiday season; 40+ for Toys "R" Us Direct, a new division responsible for the Web effort and catalog sales (number includes 10 from IS and 10 in fulfillment)

sales a bigger priority: It formed Toys "R" Us Direct, a division dedicated to Web and catalog sales, and it appointed Joel Anderson, a five-year, Harvard Business School-trained Toys "R" Us veteran, to the post of vice president.

In June Toys "R" Us Direct launched its e-commerce Web site, offering 1,500 products, priced the same online as they were in the stores. In August, according to Media Metrix, the Toys "R" Us site was visited by .5 percent of Internet users, while in the same month eToys was visited by 1.2 percent of Internet users. By September the number of products on Toys "R" Us Direct had grown to 2,500, and the company expected approximately 4,000 products to be offered online by the start of the holiday shopping season. Anderson's division had the complete attention of 40 employees, 10 of whom are IS staffers, and another 10 of whom handle fulfillment, both for the Web site and for the new Toys "R" Us paper catalog effort. The company outsourced its online customer support to a company in North Carolina, which is staffed by dedicated Toys "R" Us-trained service reps.

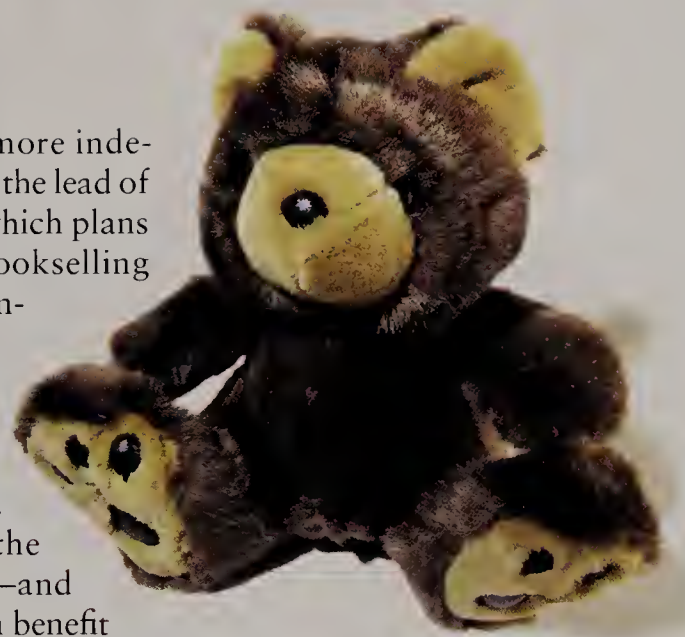
Trouble in Toy Land

The Toys "R" Us focus on the Web and on direct, out-of-store sales comes as the company is going through turbulent times. Its share of the U.S. retail toy market dropped from 18.9 percent in 1996 to 18.4 percent in 1997, according to NPD, in part because of growing toy sales competition from discounters Wal-Mart and Target. This year its second quarter earnings dropped. And in September it announced a reorganization and several changes, including closing 90 of its more than 1,400 stores worldwide, renovating existing stores to make them more customer friendly and reducing inventory. Anderson, however, says the reorganization has not hurt his division. Web and direct sales are seen as a priority for the future although not as a means for getting the company back on track in 1998 and 1999.

In October, as a sign of the independence of the unit, Anderson's crew moved into its own office building in Montvale, N.J., a few miles north of headquarters. Even as

the division becomes more independent, it won't follow the lead of Barnes & Noble Inc., which plans to spin off its online bookselling unit into a separate company to give it the flexibility it needs to attack the legendary Web-only first-mover in its space, Amazon.com Inc.

As Anderson sees it, the Toys "R" Us Web site—and its Web customers—can benefit only by its link to the brick-and-mortar stores: Customers can buy things on the Web and return them in stores, and register for items in the stores and purchase them on the Web. In the future, he hopes to enable them to register online and shop on the Web or in the store. On the marketing end, Toys "R" Us can integrate customer information from the Web with the 61 million-customer direct marketing database it has built up from brick-and-mortar store customers, and it can track whether those customers shift their buying habits from the store to the Web or buy more online than they do in the store. "We can take advantage of the big parent that we have in terms of dollars and cents and infrastructure," Anderson says. "But at the same time, we can continue to get quicker and more nimble."



DATE LAUNCHED

Toys "R" Us
June 1998

...

eToys
October 1997

Online Only Versus Online-Offline

One nice thing about having an online store is the ability to stock a wide variety of toys. eToys, which runs its own warehouse, carries both popular mainstream toys, such as standards as Barbie and Star Wars figures, and specialty items, such as Breyer horses and Brio trains. eToys' Lenk sees that as a competitive advantage over Toys "R" Us online. Yet now that Toys "R" Us is on the Web and has a dedicated fulfillment center just for the Web and catalog efforts, Anderson says, it can have a similar advantage.

While the site this year carries only a selection of items that are sold in



COVER STORY: E-COMMERCE

PRODUCTS OFFERED

Toys "R" Us

Approximately
4,000 SKUs from
200 manufacturers

...

eToys

6,000 SKUs from
nearly 500
manufacturers

the superstore, next year it will carry much more of the superstore's stock and experiment with niche items that would not be found in a typical Toys "R" Us store.

"Toys 'R' Us is a mass marketer, and for us to carry an item that sells 5 or 10 pieces in each of our stores isn't a profitable venture to take," Anderson says. "But now, with the Internet, we only have to carry one inventory, so we can start to develop new products and test new niche products that we never even dreamed of carrying."

For eToys in particular, the biggest challenge as well as expense of online merchandising is easy to find: getting the word out.

"We're trying to educate people who currently shop by driving off to stores with kids in tow that there's another option,"

Lenk says. To get its message out, eToys is

working on all media and distribution fronts. It hired Kalis & Savage Advertising, in Pacific Palisades, Calif., to run its first-ever print and television advertising campaign, which debuted late this year. The print effort includes ads in family magazines, such as *Child Magazine* and *Family Fun*, and coupon inserts in major metropolitan newspapers. The television campaign includes network spots intended to reach a general audience and a more focused

campaign aimed at women age 25 to 49, otherwise known as moms. Online, it will continue its ad deals on Yahoo, Excite and Infoseek, and it will run e-mail promotions to marketing partners. In October eToys became the premier online toy store for SesameStreet.com, a spot it will hold until 2000. Lenk won't say how much he has spent on marketing and advertising, but he says that that part of the business will consume most of more than \$10 million he has raised in venture capital.

Marketing, says Lenk, "makes other costs pale in comparison." Toys "R" Us has the advantage of having a well-recognized offline brand. For the fourth quarter, it is trying to achieve the same status as an online brand. The company became

a tenant on AOL's shopping channel in October and was planning a similar deal with Microsoft. It has purchased several keyword buys on Yahoo, including the inventory that eToys didn't purchase for the key word

COUNTING ON NUMBERS: Toys "R" Us Vice President Joel Anderson has the help of a 61 million customer direct marketing database.



Objects @ Work.

The future belongs to objects

Jasmine™ is the future of objects.

It's the first complete and pure object solution.

It's not a hybrid. It's not hype.

Jasmine is real. A proven, complete object-oriented database and development environment. So now you can build the next generation of multimedia business applications and run them everywhere: client/server, Internet, intranet, and extranet.



INFORMATION IN
HARMONY™

Introducing The Industry's First Multimedia, Internet-Enabled Object Database.

With built-in multimedia and Internet support, Jasmine has it all. A pure, object-oriented database. Drag-and-drop development environment. Distributed object delivery. Efficient database multimedia storage and manipulation, and efficient delivery through streaming and caching. The industry's easiest development environment lets you use all your favorite tools: built-in VB integration, native Java support, and C++ support.

Unlike hybrid or partial object solutions, Jasmine actually works.

So you can shorten your time to market and gain a distinct competitive advantage.

If that sounds good, pick up the phone right now. Because Jasmine is ready today.

Are you?

**Call 1-888-7 JASMINE for your FREE Developer Edition CD
or visit www.cai.com**



**COMPUTER[®]
ASSOCIATES**
Software superior by design.

©1998 Computer Associates International, Inc., Islandia, NY 11788-7000.
All product names referenced herein are trademarks of their respective companies.

Introducing Jasmine™ Objects @ Work™



toy, and it has bought ad space on Yahoo's home page for the last week in November and the first week in December, positioning that Anderson believes will yield about 30 million impressions. The Web site's URL appeared on every page of its holiday paper catalog, the company's first general-audience direct mail and ordering catalog, which was sent to several million households in October. Every Toys "R" Us print ad and television commercial will display the URL; one of those commercials shows a child with a parent in front of a computer screen, with the implication that they are on the Net together. Toys "R" Us will also be able to promote its Web site to the tens of millions of consumers who shop its stores, Anderson says, and do so at virtually no cost: As customers exit this holiday season, they will see a 4-by-12-foot banner that shows the URL and the slogan, "Shop at home with us."

NUMBER OF STORES

Toys "R" Us

1,462

...

eToys

none

Ring in the New

How loyal are online customers to offline companies?

I am much more likely to buy from new companies

7 percent

I am more likely to buy from new companies

15 percent

I may or may not buy from new companies

36 percent

I am more likely to buy from companies I use offline

16 percent

I am much more likely to buy from companies I use offline

10 percent

SOURCE: ACTIVMEDIA INC., PETERBOROUGH, N. H., 1998; FROM A SURVEY OF 3,175 ONLINE USERS



How Big an Advantage Is First-Mover Advantage?

How hard will it be for Toys "R" Us to persuade people to shop at home with them rather than with eToys? A lot harder than it might seem, one analyst says, even though shopping at one Web store or another is only a matter of typing in a different URL. Online shoppers are loyal, says Forrester's Maria LaTour Kadison, a senior analyst. Convenience is the number-one factor that keeps shoppers coming back.

Good retail sites can add features to make shopping more convenient, such as storing customers' credit card numbers and shipping addresses so that they don't need to rekey them on every visit. Those same features increase customers' "switching costs"—the hassle of doing business somewhere else—and make it that much harder for a latecomer to convince those customers to switch. "The longer [a company] waits on the sidelines," Kadison says, "the more money it's going to have to spend later to get these customers back."

At Toys "R" Us, Anderson doesn't believe that his company lost much of an advantage by coming a little later to the e-commerce table. "It's not like eToys is at a several hundred million dollar run rate like Amazon.com is," Anderson says, adding that he doesn't expect online toy retailing to really take off until 1999 or 2000. And in a 3-year-old industry, another analyst notes, it is too early to count any second-mover mass merchandisers out. As Web shopping evolves from a dry, catalog-type experience to a more multimedia experience, mass merchandisers' background in stimulating and entertaining customers will come to bear. Smart mass merchandisers will also be able to take advantage of marketing and distribution synergy between their online efforts and their retail stores. "These companies have deep pockets and they're not going to go away," says Harry Wolhandlerr, director of research at ActivMedia Inc. in Peterborough, N.H. "This battle is going to be fought over 10 years, not 1 year, and not over what was the Internet but what it will become." **CIO**

Senior Writer Sari Kalin can be reached via e-mail at skal@cio.com.

Our Customers Choose To Work With **integrity**

Ross Holman, CIO of PageNet, relies on MKS to ensure corporate Intranet and software development integrity.

His IT professionals use MKS's award-winning software configuration management (SCM) technology to manage team software development. With MKS as a business partner, PageNet builds reliable software faster and better than ever before, meeting the demanding needs of more than ten million pager users. And to manage the Intranet, MKS is also there for PageNet with Web Integrity.

MKS products and services manage the collaborative development of software and information. Our name and our software are critically acclaimed, and endorsed by industry partners: IBM, Netscape, Microsoft, Powersoft, and others.

Mission critical software drives global corporations like PageNet. And MKS brings integrity to software for client/server and the Web. Let us deliver integrity for your IT systems.

To learn more about MKS, our products and our services, point your browser at <http://www.mks.com> or call us at 1-800-265-2797.



Managing Change with Integrity

MKS 1-519-884-2251

UK +44 181 335 5920

Germany +49 711 16714 0

France +331 3082 2762

Scandic +45 3325 6555

"As the world's largest wireless messaging company, it is imperative that our IT operations run with clockwork precision. The software running our customer billing, pager activation and finance processes is mission critical. To ensure our software development integrity, we turned to MKS's software configuration management solution. Now, with our development house in order, we're tackling the same challenge on the Web, and again, MKS is there to help."

Ross Holman — CIO — PageNet

MKS, MKS logo, Managing Change with Integrity and Web Integrity are trademarks of Mortice Kern Systems Inc. All other trademarks acknowledged. ©1997.



It's nice to know about something

 Maximize Network Uptime, Minimize Mistakes.

BECAUSE IT'S WHAT YOU DON'T KNOW THAT CAN HURT YOU, WE OFFER SNIFFER TOTAL NETWORK VISIBILITY (TNV). SNIFFER—THE NAME SYNONYMOUS WITH NETWORK UPTIME—KEEPS YOUR NETWORK HUMMING AT FULL CAPACITY. SLOW EMAIL? SPENDING MORE THAN YOU CAN AFFORD FOR HIGH SPEED ATM AND GIGABIT ETHERNET LINES? THEN OPTIMIZE YOUR NETWORK WITH THE NUMBER ONE NETWORK MANAGEMENT TOOL IN USE TODAY. WHAT'S MORE, SNIFFER NOW COMES WITH RMON,

SERVICE LEVEL MANAGEMENT AND PRO-ACTIVE ROUTER MANAGEMENT.

 Knowledge versus Information.

IF YOU'RE ON CALL WHEN ROUTERS OR SWITCHES FAIL AND THE NETWORK DEGRADES, YOUR BEST ALLY IS SNIFFER.

WITH REAL TIME EXPERT DECODES FOR OVER 300 PROTOCOLS, ONLY

SNIFFER GIVES YOU THE KNOWLEDGE TO RE-ROUTE NETWORK

TRAFFIC AROUND BOTTLENECKS AND KEEP YOUR NETWORK RUNNING FULL OUT. AND

WITH A FULL WINDOWS NT GRAPHICAL USER INTERFACE, SNIFFER MAKES LAN AND WAN MANAGEMENT INTUITIVE.

 Real Time Automated Proactive Response.

SNIFFER TNV COMES FULLY INTEGRATED WITH OUR AWARD WINNING MAGIC TOTAL SERVICE DESK. TROUBLE TICKETS ARE GENERATED SIMULTANEOUSLY DURING NETWORK BROWN OUTS, AND PROACTIVE

She's
a
man!

before it becomes a problem.

AUTOMATED RESPONSES REDIRECT TRAFFIC THROUGH ALTERNATIVE LINES—SO YOU CAN COUNT ON SNIFFER TO BE THERE WHEN YOU'RE NOT. OR, IF YOU LIKE, YOU CAN HAVE THE NETWORK FIND YOU VIA OUR EVENT MANAGEMENT AND ALERTING MODULE. WITH SNIFFER ON THE JOB, IT'S LIKE INSTANTLY DOUBLING YOUR MANPOWER.

 Best-of-Breed & Integration without Compromise.

NOW YOU NO LONGER HAVE TO SACRIFICE BEST-OF-BREED TECHNOLOGY FOR TIGHT INTEGRATION AND SINGLE VENDOR SUPPORT. SNIFFER TNV MANAGES NETWORK RESPONSE, PLANNING AND FAULT ANALYSIS IN A SINGLE SOLUTION. WHAT'S MORE, WE'VE COMBINED NETWORK MANAGEMENT WITH SUPPORT MANAGEMENT BY INTEGRATING THE MOST WIDELY USED NETWORK MANAGEMENT TOOL—SNIFFER—WITH THE MOST WIDELY USED NT HELP DESK—MAGIC TOTAL SERVICE DESK. SO NOW WHEN YOUR BOSS ASKS, "SHOULD WE BUY BEST-OF-BREED OR AN INTEGRATED SOLUTION?" YOU CAN SAY "YES."

 The Choice of Experts.

SNIFFER IS THE HANDS DOWN CHOICE OF THE LEADING NETWORK EQUIPMENT

COMPANIES, ISPs AND THE FORTUNE 100 TO KEEP THEIR NETWORKS UP AND RUNNING. SNIFFER, NOW AVAILABLE WITH RMON BUILT-IN, STOPS NETWORK BOTTLENECKS BEFORE THEY STOP YOU. THAT'S WHY SNIFFER IS THE CHOICE OF NET EXPERTS.

 Net Tools: The Solution for Securing and Managing your NT Network.

NET TOOLS COMBINES THE MANAGEABILITY OF OUR NET TOOLS MANAGER SUITE OF NETWORK FAULT AND PERFORMANCE MANAGEMENT TOOLS, HELP DESK, ASSET MANAGEMENT, REMOTE CONTROL AND DIAGNOSTIC CAPABILITIES WITH NET TOOLS SECURE, THE WORLD'S FIRST SECURITY SUITE TO BRING TOGETHER ANTIVIRUS, FIREWALL, INTRUSION DETECTION, ENCRYPTION AND AUTHENTICATION. TOGETHER, THEY BECOME NET TOOLS, THE ONLY COMPREHENSIVE MICROSOFT WINDOWS NT DISTRIBUTED SYSTEMS MANAGEMENT SOLUTION. CALL 800-332-9966, DEPT. 5541 FOR OUR WHITE PAPER ON PREVENTING NETWORK BOTTLENECKS OR VISIT OUR WEBSITE AT [WWW.NAI.COM](http://www.nai.com). IT MIGHT JUST SAVE YOU FROM AN EMBARRASSING SITUATION.

N
e
t
T
o
o
l
s



Sniffer Total Network Visibility



Magic Total Service Desk



McAfee Total Virus Defense



PGP Total Network Security



Who's watching your network

INTERVIEW: BRAN FERREN

Tomorrow Lain

*Disney's Bran Ferren talks about
CIOs, the Web and the costs of
being behind the curve*

BY ART JAHNKE



PHOTOGRAPHY BY ROIN KRISSEL

q
b



ran Ferren's
title is execu-
tive vice president for cre-
ative technology and R&D
at Walt Disney Imagineering
in Glendale, Calif., but his occupation
appears to be full-time thinker,
dreamer and philosopher. Ferren has
won numerous awards for his work in
theater, film and photography and was
nominated for an Academy Award for
the visual effects he helped produce

for the 1986 movie *Little Shop of
Horrors*. We talked to Ferren about the
role of the Web—and the CIO—in the
future of business.

CIO Web Business: I've heard you describe yourself
as being primarily a storyteller. How do you think the
Web will change the art of storytelling?

Bran Ferren: The Web is a storytelling medium. Most people
function in a storytelling mode. It's the way we communicate
ideas, richly, as well as how we structure our thoughts.

INTERVIEW: BRAN FERRIN

"As well as how we structure our thoughts"—that's an interesting statement. Tell me more about that.

Well, I don't know anyone who remembers things based upon a string of facts. You remember because you assemble things in a storytelling form. I would argue that genetically our brains are wired for storytelling. It's our method of organizing information for presentation to others.

I have never known a great teacher, a great political leader or a great military leader who also wasn't a great storyteller. Education is a storytelling problem.

Leadership is a storytelling problem.

Ultimately, being a CIO is a storytelling problem. However, most CIOs don't understand that.

How is being a CIO a storytelling problem?

On multiple levels. Because you're a leader of an organization and your job is to identify and articulate that vision of the organization. I often find that technology information organizations don't have a vision. What they function in is trying to keep their head above water. You know, barbarians at the gate. They are up there on the list of most despised entities within most companies. I feel comfortable with this because always having been part of creative groups or research and development, I am also on the list.

Now the storytelling may be one person conversing with another via e-mail. It may be showing the stock price of the company. It may be showing the financial status of the company at any moment. A string of numbers in abstraction doesn't mean anything. But a presentation, for example, of the financial state of the company in a way that is compelling and immediately gets people's attention is good storytelling. I think if more CIOs understood that ultimately what they are doing is enabling the art of storytelling, they would be more effective at communicating the deeper ideas that generate the perception of value in their customers.

So our IT departments, or at least our databases, are kind of the memory artists of corporations?

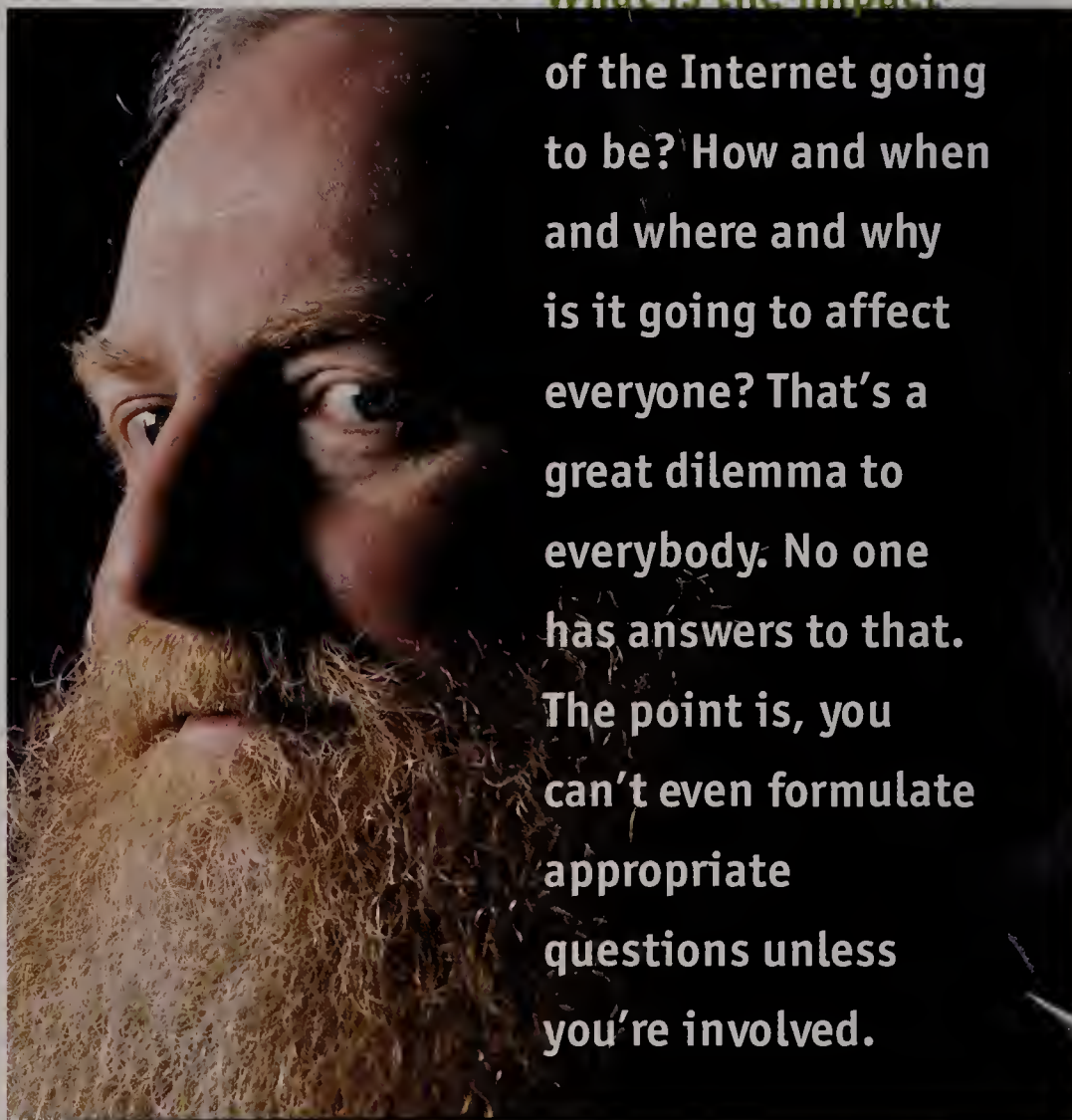
Yes. There's the mechanical memory, but then there's also the deeper memory. The deeper memory of a corporation has to do with the sense of community, colleagues functioning together, history, accomplishments and so forth. All of that ultimately makes up the culture of a corporation.

Part of the issue is how to convey that to the outside world. Information technology is now being used to do that

in the Web pages that many companies are now using, and they're doing it incredibly badly because they're not taking it seriously as a storytelling problem. Often the Web experience is frustrating, difficult, convoluted. I can't tell you the number of times I've gone to the Web page of a company and spent ages waiting for dumb graphics to download information. How many times have you seen, for instance, a company that's posted on the Web that doesn't bother to give you a phone number? I don't want to talk to the webmaster or webmistress. But I may want to talk to the president of the

What is the impact

of the Internet going to be? How and when and where and why is it going to affect everyone? That's a great dilemma to everybody. No one has answers to that. The point is, you can't even formulate appropriate questions unless you're involved.



company or someone in sales or someone in marketing, and I want to do it immediately. Or you want to go somewhere, like to look at products, and the last thing that comes up on the page is the hyperlink for products. So meanwhile, you're looking at all this other junk and high-resolution photos and images and other stuff.

People will do pages that say "under construction." What is this "under construction" nonsense? If you want something that's preliminary, fine. Put up something preliminary. But when I'm on the Web, I want to know about the product you make. This doesn't seem like rocket science. They'll tell me about employment, and they'll tell me about their corporate structure and their history and their analytical report, then nothing about products. Even if you have to put up a typed page of products, and then a contact to call at the company, do it. This is common sense.

The problem is that in most companies, the Web is considered a strange and unnatural thing, and the process of designing it is disconnected. In fact, there's an age gap where many of the very senior people in companies, who are making decisions about these things, aren't online. So they're approving, looking at, reviewing things that they're never accessing themselves, nor are they part of the culture of how people use the Web.

What needs to happen?

The key decision makers have to get in the game and be online. If you cannot understand the behaviors, likes and needs of your customers, you're being isolated from the critically important community you need to reach. So rather than it being the badge of honor that you don't have a computer on your desk, get one. Whether it's at home or at work, be online. We still have companies and IS departments that basically don't want people on the Web.

The whole future of a lot of companies and their marketing is going to shift to the Web—yet their employees aren't allowed to be on it because managers are worried about them playing games or shopping or downloading porn sites. At a certain point, you just have to get over this. I've heard arguments from CIOs that they're spending X dozen hours a week chasing down violations of Internet stuff. Give me a break. Substitute the words "newspaper," "U.S. mail," etc., for "Internet." Do you prevent your employees from using the mail? If it's their lunchtime and they read a newspaper, looking at a used car ad, that's OK. Yet if they do it on the Web, it isn't OK.

This stuff is just silly. You get the arguments, "Well, there are people spending hundreds of hours a week downloading porn sites." My attitude is that if their supervisor didn't notice some deterioration in their performance because they're spending a hundred hours a week on a porn site, then there is a more fundamental management problem within the company.

What you want to do is engender the sense of responsibility among the employees and basically say, "Look, we're giving [Web access] to you as a tool. We want you to learn about it. We want you to understand it. We want you to become part of it, because ultimately, it's important to your perception and what your job is and will evolve into. At the same time, we'd appreciate it if you would act with the same responsibility with this as you do with all the other tools and freedoms you're given." That to me is a rational approach. At the same time, the arguments are, "We have to supply all that bandwidth." Yes, you do. And you have to supply an infrastructure that will support it and so forth, just as you do a mail system, just as you do a telephone system and just as you do heating, ventilating, air-conditioning and light.

If a company does all those things, what can it expect to get in return?

It can expect to be in the game. Without doing that, you're not in the game. Once you're in the game, then it's going to be based upon the skills and competency of your people, how they're organized and how the leadership of the com-

pany directs and redirects the vision of the company to embrace it. You can't even begin that process unless your people are wired and are participating in that community.

What is the impact of the Internet going to be? How and when and where and why is it going to affect everyone? That's a great dilemma to everybody. No one has answers to that. The point is you can't even formulate appropriate questions unless you're involved.

How do you see companies getting the most from the Web?

I personally use the Web as an intelligence amplifier. I have my search engine of choice on my desktop continuously. Someone will call me and ask me a question. While they're asking me, I can type into the computer, do a query, get back dozens or hundreds of responses. While I'm literally in the middle of a conversation, I can be more valuable to them just because I have this available to me. This is a pretty fundamental thing. It is directly valuable and helps me in doing my job. I find it hard to believe that there are many jobs to which this would not apply.

Many companies—most companies—are behind the power curve in terms of how they deal with this stuff. They've got to do something about it. Ultimately, they can be proactive and initiate the change themselves. The CIO takes the initiative, takes the flak, gets the money and goes and does it. Or it's just a more slow, painful, protracted process. But it is inevitable.

It's also inevitable that every corporation in the United States should be adopting an Internet-like model for how it structures its IS systems. It's not even subject to discussion.

How is the Internet changing the inside of companies? How are intranets changing thought processes within companies?

In most companies, it isn't even happening, and that's the sad part. People sometimes treat the whole notion of an intranet and so forth as if it's some type of miraculous thing. An intranet is simply a way of getting the advantages of Web conductivity and friendly interface extended into what you're doing within a company.

When it comes to the internal workings and processes of a company, often the effect isn't radical, it just makes things better. Part of the challenge is I don't think most IS departments are starting to think about what their brand is. I think they're missing a huge opportunity.

How can an IS department think about what its brand is?

For the same reason any company can think about its brand. It's what you present to your customers. In the IS world, you have customers: the employees of the company who are connected. Those customers have a perception of you, what you do, what your department does and so forth. Traditionally, IS has been a largely invisible process. You see products moving back and forth, but the infrastructure ought to be invisible. Increasingly it isn't invisible because it does it badly. E-mail, for example, is generally a corporate disaster.

INTERVIEW: BRAN FERRÉN

Corporate IS departments generally don't have a lot of competition.

Oh, absolutely. But it's time people realized that there is an opportunity now: They have the tools to actually improve the quality of life of the employees in the company significantly. Those who embrace that concept and run with it, rather than take the barbarians-at-the-gate philosophy, could reap extraordinary rewards for themselves and their companies. If you can make everybody's life just 1 percent more efficient through the IS system—1 percent across a whole company has real impact.

So often people focus in the opposite direction, pick a specific department or specific issue that either is in trouble and make it a little less in trouble, or take a bunch of stars and make them bigger stars. Well, the effect on the area under the curve is often quite minimal. At the same time, a company getting a 1 percent to 5 percent enhancement in the overall productivity of the company seems like a pretty attainable goal.

Disney is said to have a model privacy policy. Was that hard to come up with?

Every company should do that—it's not extraordinary. If you're going to be in a situation where you are taking advantage, in the positive sense, of the information that is available to you through the Internet, for example, either by people contacting you and so forth, you should tell people what you're planning to do with it and/or give them options. Ultimately, much of it just has to do with ethics and responsibility. Do you take people's confidentiality seriously? How do you use it? What do you do with it relative to marketing? Using this information to make your site better, to understand what people are using, what they're not and where they seem to get confused is very important in the whole design.

Keep in mind that design is an iterative process. You have to keep redesigning these things dynamically to make them better and better, unlike the print medium, where you design it once, it goes out, and you have to wait a long period of time. So in a situation like a typical Web site, to be able to get that feedback is invaluable. Knowing who your customers are is invaluable. But what do you do with that information? Do you sell it to others? Do you give it to others? Stating those policies is important so the consumer understands what is being done with it.

One more thing. What's your opinion of using channels to separate quality information on the Web?

I think that what will ultimately distinguish quality is brand. There are all sorts of discussions now about portals, channels, brand of identity and all of that. That's been going on for several years. We don't have a stable model yet. We're going to go through a bunch of changes.

On one level people say, "I don't want someone taking control of my desktop." At the same time, you have other people saying, "I want to take control of your desktop." Obviously, if you could take control of people's desktops in such a way that they're happy with it, and you provide them with a way to get what they need, that's great. Except historically most people want choices. So if you are providing them with one type of news and they want another type of news, they want the ability to configure that. I think that in the near term, you may see branded, "channelized" approaches that are not selectable as things people try, but traditionally the marketplace determines things.

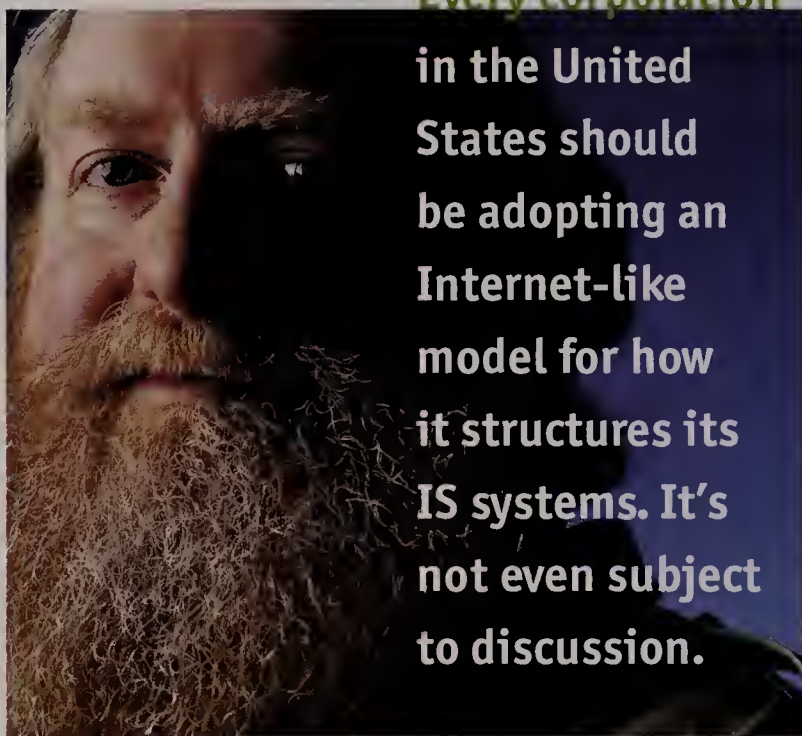
For instance, if I want ABCNews.com rather than CNN or something else, anyone who prevents me from getting that will in the long run be disengaged. You could make a play and say, "Leverage this." Well, if you have a popular site and you have someone's branded identity there, clearly you're giving an advantage and there are synergistic opportunities there.

Ultimately, the marketplace will determine what works and what doesn't. The notion of channels as a method to get to things—look, there are a whole bunch of hierarchical,

philosophical, storytelling ways to organize the way you present information and options to people. This will be in a state of continuous evolution for many years as we try things, see how people like them and react to them, and better things come along.

For the same reason, we watch evolution in how human beings interface with computers. Twenty years ago, you had to type bizarre hieroglyphics and be able to interpret what came back from the computer. Then we went to the next level of operating systems, which were more user friendly, but you still needed a funny series of commands, to overlapping window, icon-driven interfaces, to dynamic interfaces, to streaming interfaces, etc. It's in a state of continuous evolution. We have not approached Nirvana. **CIO**

Senior Editor Art Jahnke can be reached at ajahnke@cio.com.

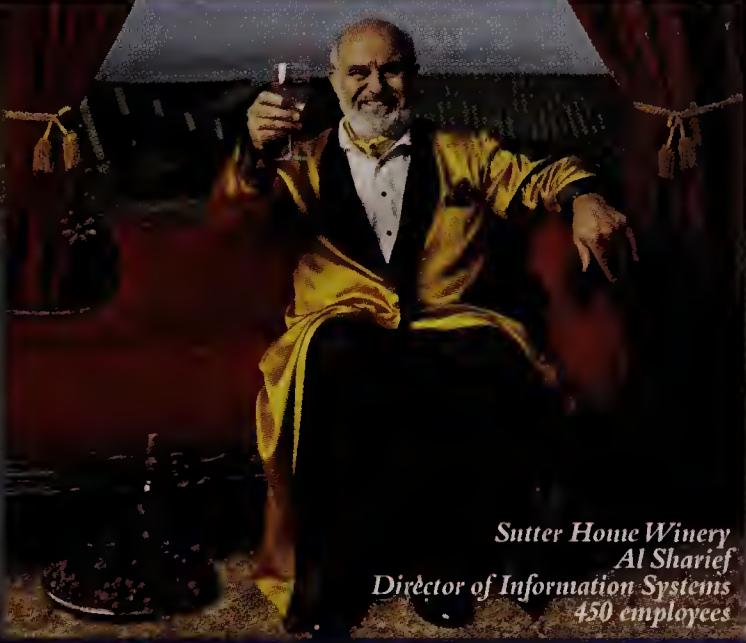


Every corporation in the United States should be adopting an Internet-like model for how it structures its IS systems. It's not even subject to discussion.

ESRI
Jack Dangermond
President
\$244 million in revenues



Sutter Home Winery
Al Sharief
Director of Information Systems
450 employees



SAP business software. **Because big ideas apply to every size business.**

Pioneer New Media Technologies, Inc.
Ann Szilagyi
VP, Operations & Administration
\$200 million in revenues

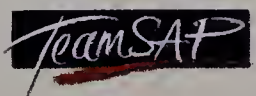


Callaway Golf
Don Dye
President & CEO
\$843 million in revenues



SAP business software helps you think big, just like these growing companies. It connects your people by linking their departments together. So you can all share information, work faster and cut costs. To help big ideas take shape fast, we'll get you up and running according to your schedule and budget. SAP business software lets you think outside the box, because success comes in all shapes and sizes.

For more information, visit www.sap.com/usa or call 1-800-283-1SAP.





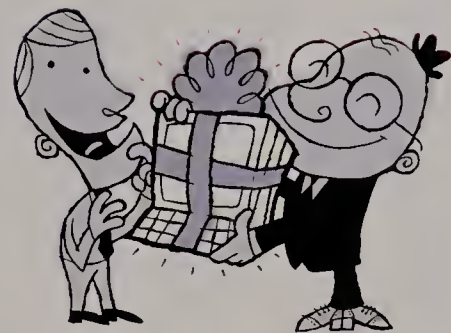
[PERSONNEL]

connect

John Gray: "We can provide a valuable service to employees with fewer people and less processing."

*By moving select HR functions onto the Web,
a growing number of companies are discovering
the benefits of letting employees help themselves*

BY LYNDA RADOSEVICH



In an effort to make their humans feel like valued resources, many companies give workers free turkeys around the holidays. But Olin Corp. tops that by a mile. In 1995, the company's Chlor-Alkali division in Cleveland, Tenn., gave each of its 1,300 primarily blue-collar workers a new, \$2,800 home PC, and the division continues the practice with all new hires.

The extraordinary giveaway helps employees become familiar with PCs in a comfortable environment, and it is part of Olin's broader plan to use information technology to modernize and improve efficiency. One key cost-saving system at the company is a self-service intranet that lets employees look up their own benefits information using browsers and the World Wide Web. For instance, the company now pays all employees electronically, and workers find their payment stubs online. This feature alone saves Olin \$65,000 a year in postage costs associated with mailing out the stubs, says Mike Gilley, vice president of human resources at the Chlor-Alkali division. "There was resistance from some at first—people like holding

their check stubs. But now it's second nature to them," he says, adding that learning computing skills in their own homes, often with their children's help, has gone a long way toward decreasing people's resistance.

In this information-driven age, highly skilled employees are more valuable than ever before. To help employees gain skills and to retain those who have them, companies are offering more creative and elaborate incentives, training and benefits options. The increasing complexity of benefits plans naturally leads to escalating costs and efforts involved in administering them. According to a survey of 500 organizations conducted by

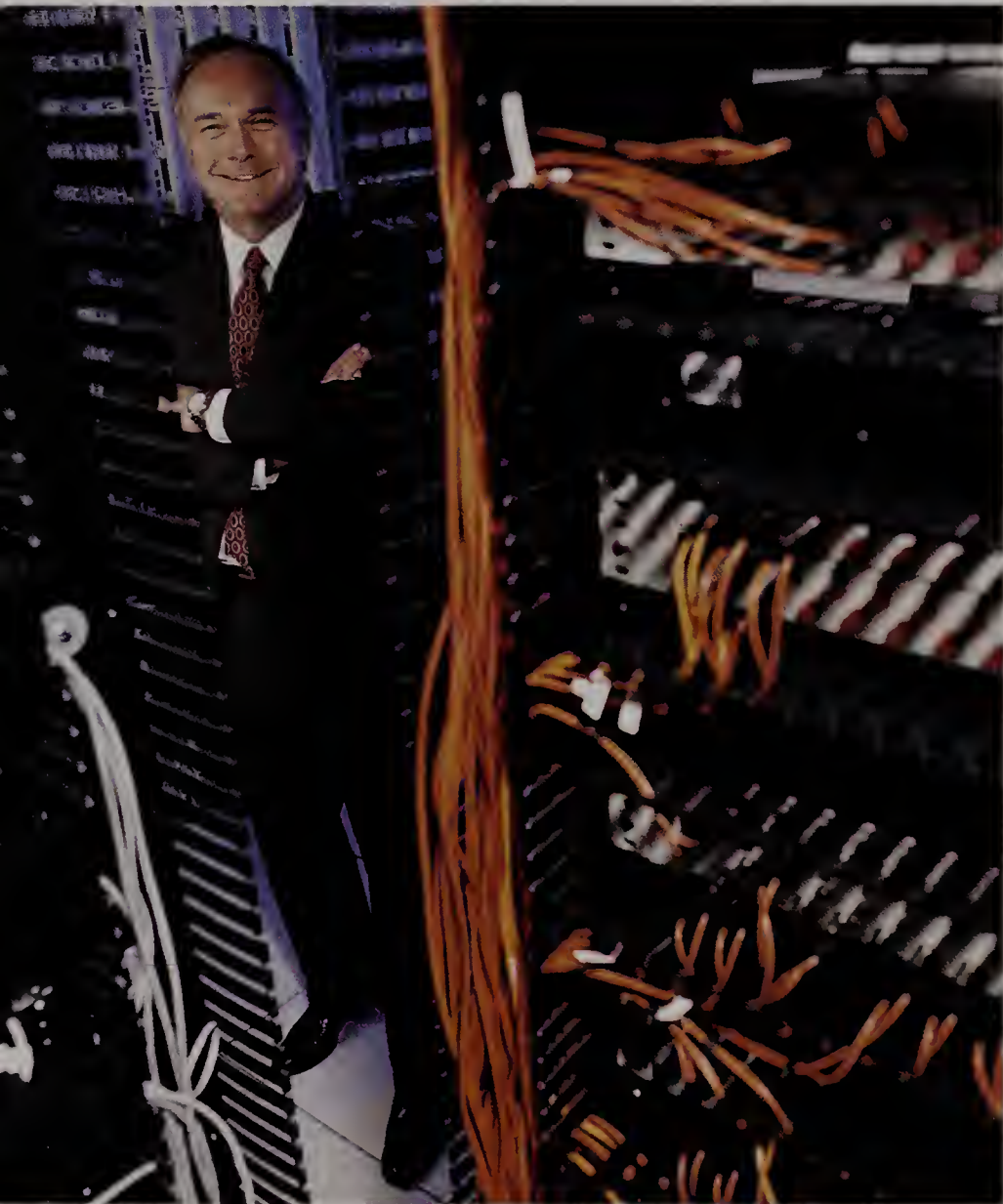
Reader ROI

BY READING THIS STORY, YOU'LL learn

- ▶ How the Web can help streamline HR administration
- ▶ Which HR functions are best suited to the Web
- ▶ How to overcome employee resistance
- ▶ What kinds of costs and benefits to expect

HUMAN RESOURCES

The Bureau of National Affairs Inc. and the Society for Human Resource Management, U.S. businesses spent \$994 on average per employee on human resources activities and programs in 1997, not including the actual cost of the benefits. That represents a sharp increase from \$762 per employee in 1996, according to the survey. For those who haven't



Donald Walker: "When I get a message saying, 'Joe was critical to a project,' I look him up and say 'good job.'"

paid attention to this often overlooked field, human resources departments typically administer health insurance, workers' compensation, payroll processing and staff recruitment. They also provide 401(k) supervision, strategic consulting on workforce development, legal guidance on employment regulation compliance and tax services.

Now companies like Olin are at the forefront of a movement in corporate America to use the Web to help streamline human resources administration in hopes of providing better service while stemming rising costs. The range of HR services going online extends from employee self-service tasks such as updating addresses to sophisticated management services such as teaching division heads how government regulations affect hiring practices. Forrester Research Inc., a market researcher based in Cambridge, Mass., estimates that a firm with \$10 billion in annual revenues can earn back a \$1.2 million startup investment in an HR self-service system in roughly one year via reduced paperwork, printing and staffing costs (see "How It

All Adds Up," Page 60). Most companies do not perform such rigorous cost justification exercises for these systems, but they cite general benefits such as serving growing employee populations and providing better service without increasing HR staff, refocusing HR staff on more strategic duties, reducing costs of processing transactions and improving access to data for managers and employees. And like Olin's \$65,000 a year in postage savings, there is enough spot evidence of hard returns to convince executives that such systems are worthwhile.

Reaping similar rewards is not necessarily easy, however. It takes careful thought to prepare the workforce for changes in how their human resources programs are run. After all, most workers are motivated by pay and benefits, and paper forms and human voices have been the interface between companies and employees since the initials "HR" first came to signify "human resources." Replacing the paper documents and voices with Web browsers and hyperlinks can frustrate and scare the unprepared, many of whom consider the Internet an unsafe place for personal information, even when the data is protected on an intranet.

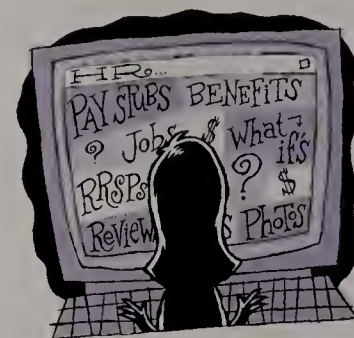
In addition, the technology for providing top-notch HR self-service systems is still evolving. Industry analysts say today's software packages either superficially cover a broad set of functions, such as letting employees sign up for health-care coverage, or they deeply cover a narrow set, such as explaining in detail the minutiae of specific health-care plans—but none covers all bases. Needless to say, this can limit their usefulness. For instance, if employees can use the system to pick from a list of 10 health-care providers, but there's no way to access key backup information on the providers, they'll call HR information and won't bother with the system next time, says Tom Gormley, senior analyst in the packaged applications strategies practice of Forrester.

Still, companies that approach Web-based HR systems with plenty of forethought are finding that the gains outweigh the hassles, making this area an increasingly hot candidate for using the Web as a business efficiency tool.

Replacing paper documents and human voices with Web browsers and hyperlinks can frustrate and scare the unprepared.

Companies vary in their approaches to putting HR services on the Web, but the most common items to put online first are Web forms for tasks previously transacted using paper forms, such as making changes to personal information. Typically, firms that do so have installed the HR portions of business management systems from companies such as The Baan Co., Lawson Software, Oracle Corp., PeopleSoft Inc. and SAP AG. Within the past two years, these vendors have adapted their systems so that people with Web browsers can view and update data, making it relatively simple to extend Web access to employees' HR information.

For example, electric utility Carolina Power & Light Co. in



Raleigh, N.C., installed a PeopleSoft HR management system in 1996. The company wanted to let employees update their personal information and look up job postings online, but the IT department didn't want to have to maintain PeopleSoft desktop software for 6,400 employees. So in early 1997 the utility, working with systems integrator NexGen SI Inc., Web-enabled its PeopleSoft applications in order to let employees review job postings, employee biographies and benefits information notices via the company intranet. Since then, the company has added the ability to check vacation days and "wellness" credits (reimbursements for healthful activities such as health club memberships) and has put paycheck stubs online. In the planning for next year are online performance appraisals, 360-degree feedback and pension revision programs that let employees conduct "what if" scenarios for their retirement plans, says John Gray, supervisor of human resources information systems at Carolina Power & Light. The PeopleSoft system enabled the utility to centralize administration of the HR function, and the Web self-service aspect reduced administrative trivia to the point that 12 people in a call center can now handle the questions that roughly 50 people in distributed divisions used to handle, albeit not full-time. Now the remaining HR staff is freed up to pursue more strategic initiatives such as recruiting. "The fact that we can provide this information online in a Web format means we can provide a valuable service to employees with fewer people and less processing," Gray says.

That's a goal shared by most companies. HR departments characteristically spend 70 percent of their time answering repetitive questions, according to GartnerGroup Inc., a market-research firm based in Stamford, Conn. By letting employees access their own data, HR staff can spend more time attending to more vital tasks. A Web-based self-service intranet also can offer higher quality service because people get answers more quickly and more consistently than if they talk to potentially bored old-timers or inexperienced fresh hires on the HR help desk. And the intranet is available around the clock—a boon for international firms—and it improves people's ability to find each other in big organizations. At San Antonio, Texas-based insurance and financial services organization USAA, for example, one way CIO Donald Walker uses the HR intranet is to look up names, profiles and pictures of employees. "We have such a large organization, it's hard for me to learn everybody's names," Walker says. "So when I get a mes-

sage saying, 'Joe was critical to a project,' I look him up and say 'good job.'"

Another process that companies often move online first is recruiting. Companies seek good candidates by posting positions internally and externally and soliciting résumés electron-

Fear of Prying

When it comes to putting HR information online, privacy concerns abound

Miscreants can collect personal data from many sources, but there's something about knowing that information is on the Web that makes folks nervous. Perhaps it's the fact that there is no physical separation between online information and potential hackers. Or perhaps it's the fact that unlike paper, electronic records have a way of lingering even after being deleted.

Whatever the reasons for the mistrust, employees' privacy misgivings constitute the largest nontechnology hurdle to jump when making human resources and benefits information available on the Web.

Carolina Power & Light Co., for example, had considered putting employee photographs on its HR intranet, but privacy issues put that on hold. "Some employees just don't want their pictures out there," says John Gray, supervisor of human resources information systems at the utility in Raleigh, N.C.

Computer industry experts assert that such feelings are unfounded, noting that the people who worry about giving out their credit card information over the Internet often have no trouble giving it to a stranger in a restaurant or over the phone. "Privacy to some extent is a red herring because most employee data is already in electronic form somewhere," says Geoffrey Bock, a senior consultant specializing in electronic commerce at the Patricia Seybold Group in Boston.

Of course, experts say, companies must set up proper protective rules and technical systems. At Sears, Roebuck and Co.'s human resources service center in Tucker, Ga., employee information is protected by identity numbers and pass-code numbers like those used in the financial industry to protect money, says Ken Millen, director of human resources services.

HR and IT managers must also consider regulatory requirements. Among them are complex Equal Opportunity Employment Act rules and strict new European Union (EU) privacy laws, says Jenni Lehman, research director for applications of technology for GartnerGroup Inc. in Stamford, Conn. "The EU laws are strict beyond what's available in technology today," Lehman says. For instance, if a traveling executive downloads company directory information while in a country other than his home base, he may be breaking new EU laws about employee privacy, she says. (For more on these requirements, visit the International Association for Human Resource Information Management's Web site at www.Ihrim.org and see "The Great Wall of Europe," CIO Section 2, Feb. 15, 1998.)

On the positive side, many HR managers report that in time, employees do become more relaxed about the existence of their personal and benefits information on the Web. Says Mike Gilley, vice president of human resources at Olin Corp.'s Chlor-Alkali division in Cleveland, Tenn., "Privacy is a continuing concern, but people are getting more and more comfortable."

—L. Radosevich



ically. "The days of going out and buying expensive paper for your résumés are over," says Jenni Lehman, research director for applications of technology at GartnerGroup. Some packaged applications, such as those from Resumix Inc. and Restrac Inc., help manage large databases of résumés by performing sophisticated searches and ranking the findings by relevancy. One service, Alexis International Inc.'s Networker, lets companies that have outsourced their résumé processing to Alexis both contribute unused résumés (with the candidates' permission) to a Web-accessible database and search that database

national employment practices, government rules and regulations and so on. The systems also link to the Web sites of benefits service providers such as Aetna Life Insurance Co. of America and Fidelity Investments, where employees can get more detailed information on retirement investment plans such as 401(k) mutual funds.

A leading vendor in HR knowledge-base systems is Foundation Technologies Inc. of Waltham, Mass. The company's product, called Beneflex, comes with built-in databases, or "knowledge bases," that contain customizable HR informa-

tion, such as general models about how health plans work. Beneflex also lets companies link knowledge bases to individual employee data, so employees get a customized Web page when they log in to the HR intranet.

Two large Foundation customers, Sears, Roebuck and Co. and Ford Motor Co., may make such knowledge bases available to all employees via the Internet eventually, but they are beginning by rolling them out on HR call center intranets. Both companies want to make certain the systems work well and answer the right questions before spreading them more broadly.

For instance, over the past year, Sears has put thousands of pages of documents about benefits and health plans into the knowledge base used in its Tucker, Ga., human resources call center. Now, when one of Sears' 335,000 employees calls, a staff member uses the intranet to quickly answer questions, regardless of what health plan or benefits program the employee is enrolled in. Previously, the call center staff had to take a message, then shuffle through myriad books and manuals to find

the answers to questions, says Ken Millen, director of human resources services at Sears.

For Sears, the main benefit of this system is not direct cost savings but the ability to centrally support a business strategy of diversification. When CEO Arthur Martinez joined the troubled retailer in 1992, it essentially had a one-size-fits-all benefits plan. Martinez diversified Sears' business through acquisitions and new business launches. The HR department needed different benefits plans to address recruiting and retention needs in the different lines of business. The call center application is one step in a larger plan to improve administration

How It All Adds Up

Self-service HR systems can be well worth the investment

COSTS

► Initial development

Self-service platform license and implementation	\$414,000
Content-intensive applications licenses and implementation	300,000
Development team for six months	139,650
Server hardware and public PCs	350,000
[TOTAL STARTUP COSTS]	\$1,203,650]

► Annual maintenance and operations

Software upgrades at 18% per year	\$153,657
Ongoing content and technical staff	126,350
Public PC maintenance	150,000
[TOTAL ONGOING COSTS]	\$430,007 per year]

SAVINGS

► Annual savings

Elimination of benefits and payroll paperwork	\$180,000
Elimination of 75% of printing employee and manager manuals	112,500
Staff reduction	790,020
[TOTAL ANNUAL SAVINGS]	\$1,082,520 per year]

SOURCE: FORRESTER RESEARCH INC. ESTIMATES ARE FOR A COMPANY WITH \$10 BILLION IN ANNUAL REVENUES, 15,000 U.S. EMPLOYEES ACROSS 9 SITES, 60 PERCENT WITH PC AND INTRANET ACCESS, AND PEOPLESOFT HR MANAGEMENT SYSTEM FULLY IMPLEMENTED.

themselves for candidates that better meet their immediate needs.

A handful of leading-edge companies are taking Web-based HR applications a step further by providing call center staff, employees and managers with customized benefits and HR policy information needed to make important decisions. For instance, a manager might need to know whether an employee's complaint qualifies as a discrimination issue. To support these advanced Web services, companies are building so-called knowledge systems that link employee data from transaction systems such as PeopleSoft with sophisticated databases of information on executive compensation, discrimination, inter-

WINDOWS

NT WORLD

Dec/Jan

IDG Special Report

FITTING

The Challenge
of Bringing NT
Server into
Your Network



NT Workstation:
4.0 Now or
5.0 Later?



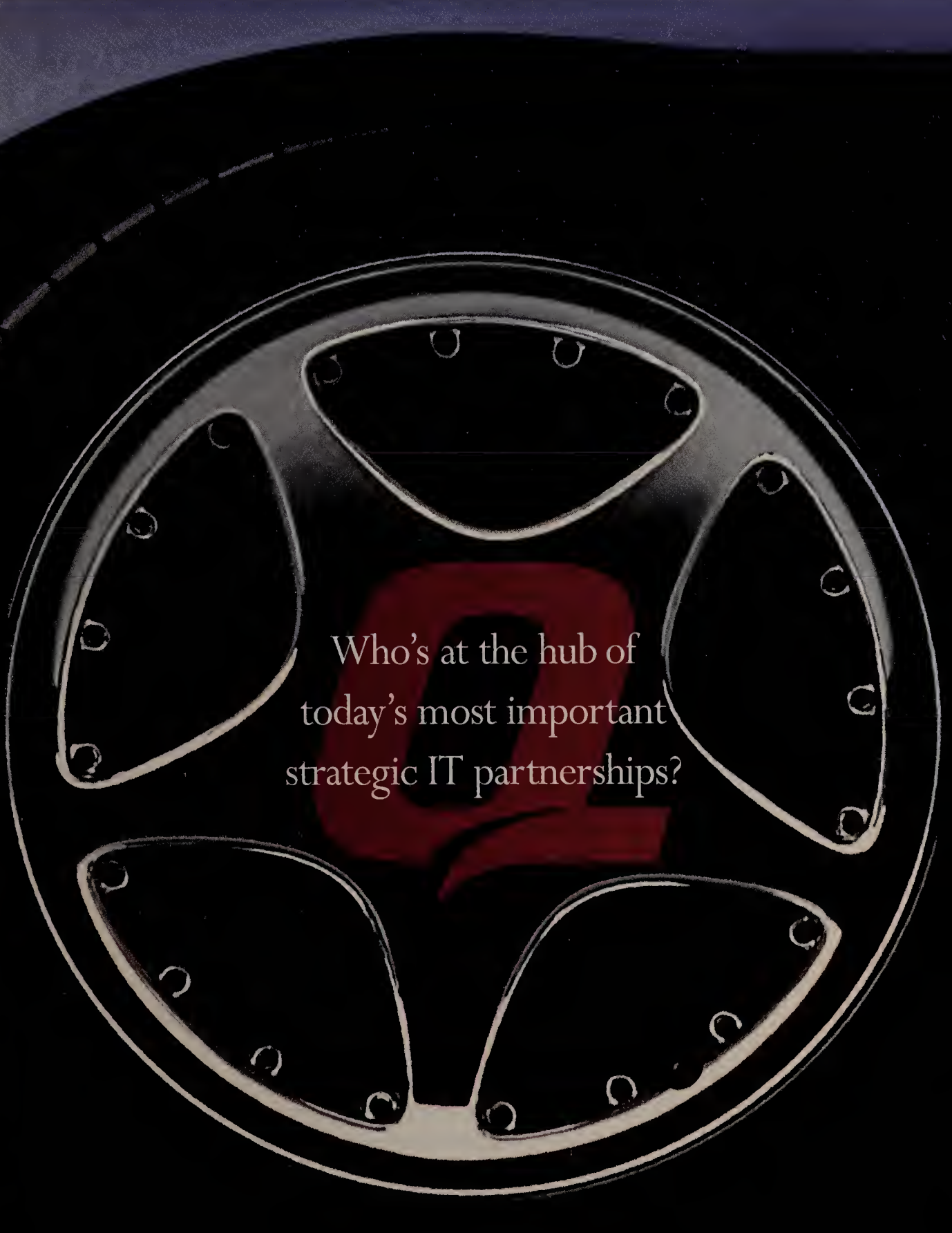
Sash Communications' Patel ponders IIS.

Pushing the
Limits of NT's
Web Capabilities

The Ins and Outs
of NT Security



We are. And whether it's working with technology partners, channel partners or our customers, it's a true collaboration, in which commerce to mission-critical applications in finance, communications, manufacturing and beyond. For more



Who's at the hub of
today's most important
strategic IT partnerships?

we help innovate, develop and

COMPAQ

fine-tune the best solutions—in everything from Internet

answers, better answers, reach

us at www.compaq.com/hub or 1-800-AT-COMPAQ.

Better answers.SM

© 1999 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Bager Associates is a service mark of Compaq Computer Corporation. All other names are trademarks or registered trademarks of their respective companies.

IN THIS ISSUE



Page 6

- 5 Briefs**
What's happening in the world of Windows NT.
- 6 Moving Up to Windows NT Workstation**
Does it make sense to move your workstations to NT 4.0 now or should you hold out for NT 5.0?
- 10 Smooth Sailing for NT**
The U.S. Navy embarks on an initiative to migrate applications from Unix to NT.
- 12 Serving Up Web Pages**
Internet Information Server (IIS), along with accompanying Microsoft Web products and technologies, is vying for dominance in the Web server market. Can IIS support complex business applications as well as serve up simple Web pages?
- 18 Cover Story: It's All in the Integration**
Making Windows NT work with what's already installed on your network is a top priority, but finding peaceful co-existence can be expensive and time consuming.
- 21 NT Training**
There's more than one way to bring NT knowledge into your organization, depending on budgets and priorities.
- 22 NT Security**
Should you place your trust in NT's security capabilities, or should you be concerned about its vulnerabilities?

Windows® NT World

Managing Editor: CARA CUNNINGHAM
Associate Managing Editor: JOHN BRODERICK
Copy Chief: JON SKILLINGS
Design Director: RONN CAMPISI
Production Consultant: KATHY BADERTSCHER

Editorial Advisory Board

ANNE A. ARMSTRONG, Editor-in-Chief, *Federal Computer Week* and *civic.com*
CATHRYN BASKIN, Editor-in-Chief, *PC World*
JOHN GALLANT, Editor-in-Chief, *Network World*
PAUL GILLIN, Editor-in-Chief, *Computerworld*
PHILIP LEMMONS, Editorial Director, *PC World*
ABBIE LUNDBERG, Editor-in-Chief, *CIO*
SANDY REED, Editor-in-Chief, *InfoWorld*
JOHN RUSSELL, Editor-in-Chief, *Solutions Integrator*

Production

LINDA MANES GOODWIN, Vice President Manufacturing, *PC World*
NADIA MAUDSLEY, Production Director, *PC World*
NANCY JONATHANS, Digital Advertising Production Manager, *PC World*
LISSE HOOKER, Ad Traffic Coordinator, *PC World*
DAN GORDON, Advertising Information Manager, *PC World*
YULIYA KORENTSVIT, Advertising Information Assistant, *PC World*
DAVID COBB, Director of Circulation Operations, *PC World*

Publisher: MIKE ROGERS

International Data Group

Chairman: PATRICK J. MCGOVERN
President: KELLY P. CONLIN
Chief Operating Officer: JAMES CASELLA

Windows NT is a registered trademark of Microsoft Corporation and Windows NT World Magazine is used by International Data Group, Inc. under license from owner. Windows NT World Magazine is an independent publication not affiliated with Microsoft Corporation. Windows NT World and International Data Group are solely responsible for the contents and editorial policy of the publication.

From the Editors

Welcome to Windows NT World

BECAUSE WE RECOGNIZE THAT Windows NT is becoming a growing force in organizations large and small, the editors at IDG are banding together to bring you a concise, complete source of NT-related information. This special report, which will reach over 2.2 million readers, is the result of an unprecedented collaborative effort among eight of IDG's foremost publications: CIO, Computerworld, civic.com, Federal Computer Week, InfoWorld, Network World, PC World, and Solutions Integrator.

The content in Windows NT World stems from the experience of editors, writers, and analysts at each of these publications. Our goal is to separate reality from marketing and hype to help you figure out what this operating system means to you and your organization. We hope to aid you in sorting

through if, how, why, and where you should use NT, and to lay out issues such as upgrading, integration, management, training, and security.

These issues are bound to become more complex. With NT 5.0 due sometime in 1999, Microsoft's biggest challenge lies ahead. Having shifted emphasis from Windows 9x to NT Workstation as the business client operating system of choice, Microsoft needs to give users good reason for upgrading to NT Workstation 4.0 now, and upgrading again to NT 5.0 in 1999. As the article "NT 5.0 Workstation Is Worth the Wait" on p. 6 illustrates, such an upgrade strategy may not be worth it. On the server end, Microsoft must convince large enterprises that NT can handle their loads and NT 5.0 will have to clear a number of technical hurdles to compete with Unix, minicomputer, and mainframe operating systems. And as our cover story "NT Server and Your Network: A Match Made in Heaven or Integration Hell?" on p. 18 points out, NT must integrate well with other operating systems in order to make it in the enterprise world.

We hope you enjoy this Special Report.

—The Editors



TERRY ALLEN

Nasdaq Puts Windows NT to the Test

But observers are skeptical about the operating system's prospects in the high-volume trading sector. By Marc Ferranti

MICROSOFT HOPES Nasdaq's decision to base the new version of its trading surveillance application on Windows NT will help make the operating system a credible choice for such high-end applications. But the historic lack of Microsoft products in mission-critical financial trading settings has industry insiders skeptical.

The new application, called MarketWatch, will analyze daily trading on the Nasdaq stock market and is slated to be up and running in 2000. Initially it will have only 25 users, but it must be capable of analyzing over 1,000 transactions per second (tps) — more than current NT applications can handle, according to Nasdaq and Microsoft officials.



performs crucial market surveillance duties, according to Bailer. Nasdaq expects in the near future to trade up to 2 billion shares in one day, so MarketWatch will have to run 800 to 1,200 tps to keep up.

MarketWatch "is a kind of 'proof of concept' for NT."

— Gregor Bailer, Nasdaq

While Nasdaq's trading system itself won't be running on NT, the new version of MarketWatch "is a kind of 'proof of concept' for NT, that it will be able to keep up with our high-volume, mission-critical system," says Nasdaq Executive Vice President Gregor Bailer.

The NT-based MarketWatch will have to "shadow" the exchange, keeping pace as it

In order to handle such a hefty load, NT and other Microsoft products that MarketWatch will rely on need upgrading, according to Daniel Kusnetzky, analyst with International Data Corp., in Framingham, Massachusetts. This means Nasdaq will be dependent on these new versions being timely and stable.

"I say 'Show me,'" says Kus-

netzky. "I wish them well, but if this system isn't going to be finished for another year and a half or more... they're going to depend on Microsoft coming out with new versions of NT, SQL Server, and Transaction Server."

One financial institution that already uses NT hasn't considered basing its mission-critical applications on Microsoft's operating system.

"We have productivity applications running on NT, but not mission-critical applications, like our treasury system," says Joe Veghelyi, manager of system architecture at the Bank of Montreal, which uses a mix of Unix and NT systems.

The current MarketWatch application runs on Tandem servers and Sun Microsystems' workstations. The new NT system will run on Unisys Aquantitas, typically four-processor machines incorporating 400-MHz Intel processors, Bailer says. The pilot system that is currently being tested uses NT Server 4.0 and beta versions of NT 5.0's "security components," as well as Microsoft's SQL Server and Transaction Server. *

MARC FERRANTI IS NEW YORK BUREAU CHIEF OF THE IDG NEWS SERVICE.

NT 4.0 FUSS

For an operating system that's soon to be labeled obsolete, Windows NT Workstation 4.0 has gotten a lot of marketing attention from Microsoft lately. In addition to sporadic full-page ads in the Wall Street Journal touting it as the upgrade path to NT 5.0, the company this summer reduced NT 4.0 upgrade costs by 20 percent. In August it introduced a licensing scheme designed to give small businesses upgrades to NT for the next two years for \$38. It also released tools to help users move from other versions of Windows to NT Workstation 4.0, and a kit that packages NT Workstation 4.0 with Service Pack 3, third-party software discounts and deployment tips. Turning its attention to NT 4.0 Server, the company recently touted results from Mindcraft labs that showed NT Server 4.0 outperformed Novell's Netware 5.0 by 25 percent. But by the time NT 5.0 is delivered in 1999, the fuss over 4.0 will likely be forgotten, as Microsoft's attention turns to pushing its "next generation" operating system.

SURVEY SHOWS NT'S WEB PROGRESS

In an August InfoWorld Web server platform survey of 100 companies, 79 percent of the respondents said they were "moving towards Windows NT as a platform." 16 percent said they were exploring alternative commercial operating systems, and 11 percent said they were looking at "open source or 'freeware' technologies."

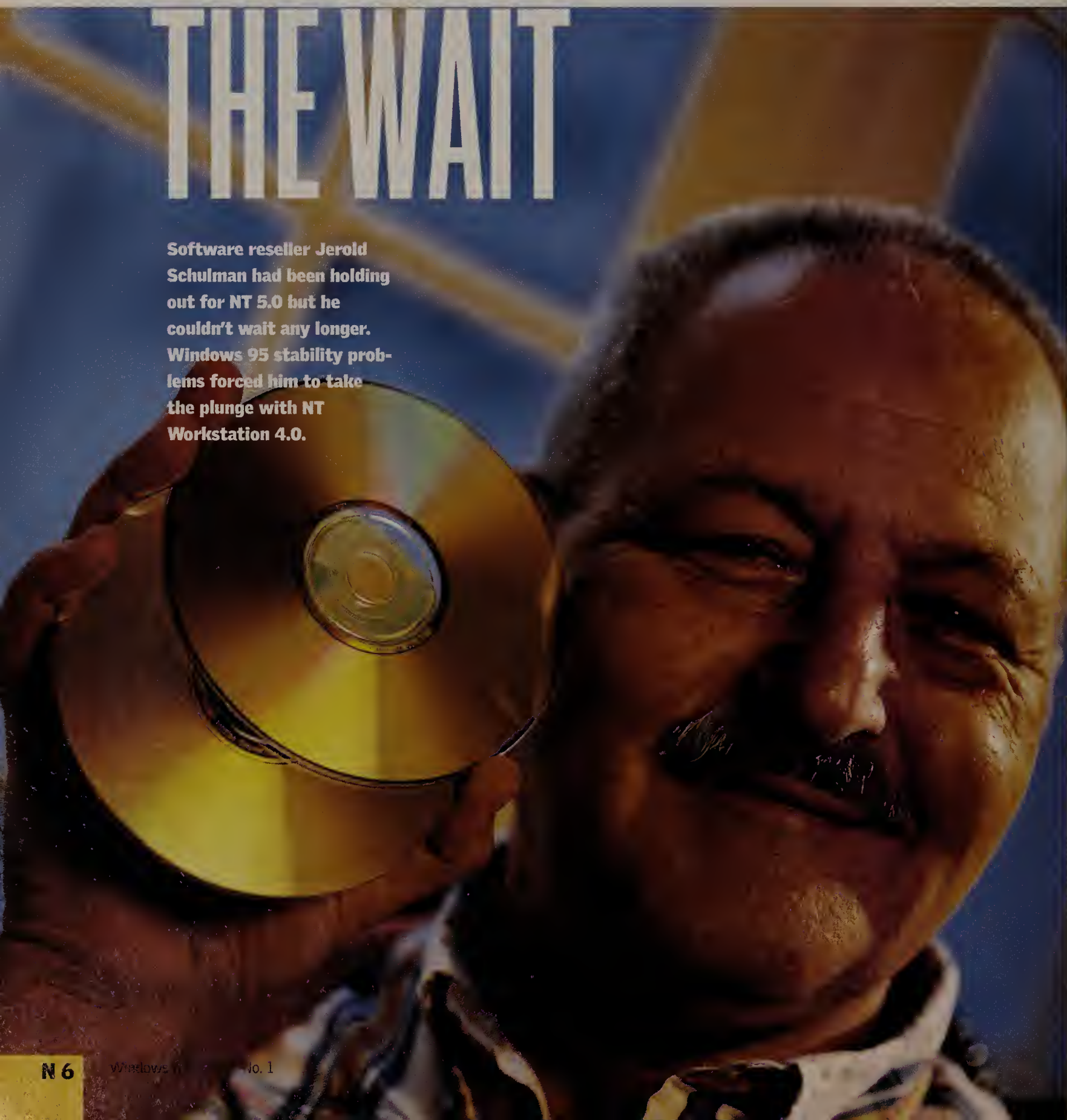
NT on workstations

NT WORKSTATION 5.0 IS WORTH

NT 5.0 is touted as the operating system of the future. But should you install NT 4.0 first? **By Michael Desmond**

THE WAIT

Software reseller Jerold Schulman had been holding out for NT 5.0 but he couldn't wait any longer. Windows 95 stability problems forced him to take the plunge with NT Workstation 4.0.



ANN STATES

SOMEDAY, Jerold Schulman may reap the expected benefits of Windows NT 5.0. But by last March, he'd grown tired of waiting. That's when he broke down and upgraded his three office PCs to NT Workstation 4.0. His network server already was running NT, but the Alpharetta, Georgia-based software reseller kept two Windows 95 machines and one Windows 3.1 system to troubleshoot problems for customers using those operating systems. But enough, Schulman decided, was enough.

"Stability was a driving factor. I'd have to reboot at least once a day under Windows 95," says Schulman. "Assuming you've got the appropriate hardware, I'd think you have to be crazy to be running a loosey-goosey Windows 95/98 operating system."

Schulman was lucky. The Pentium systems on his small network were beefy enough to handle NT's hardware demands, and his 16-bit applications still worked despite NT's many software restrictions.

The vast majority of businesses, however, will face hardware upgrades and new software purchases on the road to NT. The expected arrival of NT 5.0 in 1999 raises a yet more daunting question: Does it make sense to upgrade to NT 4.0 now if you'll

be upgrading Windows 3.1 and Windows 95 to NT 4.0. "Probably the biggest reason for the move to NT was for conformity across all the workstations," says Braun. "So support cost was one reason to do that."

Moving to NT 4.0, however, will probably strain your IT department and your hardware budget, too. Microsoft optimistically says that any Pentium system with 16MB of RAM can run NT 4.0. But realistically you need at least a 100-MHz Pentium with 32MB of RAM. And your hardware must be compatible with NT. (See Microsoft's web site at www.microsoft.com/windows/ntworkstation/info/hcl.htm.)

Even if you have the right stuff, some experts recommend buying new hardware.

"The risk associated with an in-place OS upgrade is pretty substantial."

—Chris Le Tocq, Dataquest

have to upgrade again in about 12 months? Many say that it doesn't. It's no surprise that only a handful of businesses have migrated to NT 4.0, and you should have a compelling reason if you wish to join them.

NT'S CRASH CONTROL

If your Windows 95 systems fall down once or twice a day, an interim stop at the more stable and secure NT 4.0 should provide some relief. Adopting NT 4.0 also might make sense if your business has a hodgepodge of Windows systems, spanning 3.1, 95, and 98. Jeff Braun, a practice leader of information technology engineering at Whittman-Hart in Chicago, says he helped an engineering firm with 45 desktops run-

ning Windows 3.1 and Windows 95 upgrade to NT 4.0. "When you look at the cost of a new piece of hardware with NT fresh on it and you look at upgrading an existing system with NT, it's hard to say that buying a new system is not the way to go," says Chris Le Tocq, a software analyst with research firm Dataquest in San Jose, California. "As easy as Microsoft has tried to make it, the risk associated with an in-place OS upgrade is pretty substantial."

Blame NT 4.0's registry, for starters. Its lack of compatibility with the Windows 95 and Windows 98 registries means that you must reinstall applications after the upgrade. Likewise, personalized settings such as application defaults and desktop shortcuts often must be rebuilt. What's more, NT 4.0 lacks Plug and Play and the hardware detection wizard found in Windows 95, making maintenance more complicated.

TIPS FOR THE TRIP TO NT

So you want to migrate to Windows NT? Whittman-Hart technology consultant Jeff Braun has three words of advice: plan, plan, plan.

Take inventory: Check your hardware against Microsoft's Hardware Compatibility List at www.microsoft.com/windows/ntworkstation/info/hcl.htm. You might have to replace older devices before you install NT.

Say goodbye to some software: If you have 16-bit DOS and Windows 3.x applications, test them on a stand-alone NT 4.0 workstation. They may simply refuse to run under NT.

Assemble drivers: Before you start upgrading, acquire the latest NT-compatible drivers for all the various devices on your PC.

Back it up: Plan to back up and restore data on all your workstations.

Launch a pilot: Select a group of representative systems to test-drive NT for a couple of weeks prior to the big upgrade.

Segment the network: If installing over a network, upgrade a manageable number of systems on their own segment of the network to quarantine the upgrade traffic. This will help ease troubleshooting.

Take your time: Don't expect a 50-seat upgrade to happen overnight. It could take several days or longer.

Train your staff: Despite the Windows 95-like interface, NT has some unfamiliar features.

There are other gotchas. NT 4.0 doesn't work with the FAT-32 file system—a burden if you want to upgrade a Windows 95 or Windows 98 PC that uses FAT-32. And while almost all productivity software for Windows 95 will work under NT, many multimedia titles and games that depend on DirectX — multimedia APIs found in Windows 9x — will not run. The same goes for many DOS-based applications that want direct control over memory and hardware—something that NT's strict protection scheme does not allow.

Considering the limitations of NT 4.0, Braun offers a warning about installing that software: "I would say that you have to do your homework and make sure you are



"Don't do it because you expect magical things to happen. Because usually it won't", Whitman-Hart technology consultant Jeff Braun on migrating to Windows NT 4.0.

doing it for the right reasons," he says. "Don't do it because you expect it to make magical things happen. Because usually it won't."

A BAD IDEA

Many consultants say that if your current operating systems and hardware are doing the job, moving to NT 4.0 is a bad idea, particularly with NT 5.0 coming down the pike. Large businesses will want to hold out for 5.0's management features, which

provide a centralized structure for keeping tabs on user addresses and identities and which ease everything from e-mail management to network security. Additionally, Microsoft's so-called IntelliMirror technology will allow users to access data and configuration profiles over the network, while the integrated Terminal Server Edition software lets IS managers deploy diskless workstations and other thin clients on the existing network.

NT 5.0 also adopts popular tricks from Windows 95, such as Plug and Play and hardware detection, for those upgrading without the assistance of an IS staff. It offers support for USB peripherals, DVD-ROM drives, and FAT-32. Add DirectX technology, and NT finally matches Windows 95's device and application support.

This heady combination of features promises to make NT 5.0 the best operating system for both the 1,000-seat corporate network and the single-PC home office. The big remaining question for users is, What's the best road to NT 5.0?

Microsoft still touts NT 4.0 as the way to go, noting that applications won't have to be converted or reinstalled as they must when moving from Windows 9x or 3.x. Some analysts just aren't buying it, however. They say the migration to NT 5.0 should not be any more difficult than a move to NT 4.0.

"My recommendation is that if you have your eyes set on NT 5.0, you should be thinking about deferral," Le Tocq says. "Because what you don't want to do is install NT 4.0 and then install NT 5.0 on top." *

MICHAEL DESMOND IS A CONTRIBUTING EDITOR TO PC WORLD.

NT AND 98: TWO BOOTS ARE BETTER THAN ONE

NOT LONG AGO I GAVE my 300-MHz Pentium II PC a split personality. Tired of late-night operating system crashes, I installed Windows NT Workstation 4.0 to run my office applications in a reliable environment. Yet I kept Windows 98 on the PC so I could buzz bad guys in an F-18 Hornet when I needed a break from work.

Ironically, my schizophrenic PC has never been so stable.

Dual booting is not just for home office types like me with a penchant for game play. Software developers, help-desk representatives, and IT managers will find dual booting helpful for troubleshooting, user inquiries, telecommuting, and cross-operating-system testing.

You'll need 260MB of disk space to run NT and Windows 98. And if you have an older system or run DOS or Windows 3.x software, NT may not work with your current system. Otherwise, adding NT to your operating system mix can be a relatively simple, two-hour task, provided you plan for it. Here's how:

Assess your system: You should have at least a 100-MHz Pentium and 32MB of RAM, and even then NT might not work on your hardware. Consult the Microsoft Hardware Compatibility List at www.microsoft.com/windows/ntworkstation/info/hcl.htm to see if your components are supported.

Get the drivers: Round up device drivers for your components before you get started so you have them when NT trips over an unrecognized device. And it goes without saying that you should back up your hard disk.

Always install NT last: The NT Boot Loader utility won't recognize multiple operating systems unless NT is installed after Windows 9x.

Set up your disk: Partition your disk drive into at least two drive letters, one for Windows 9x and one for NT. This allows you to use different file systems for each operating system.

Pick FAT-16: Windows 98 recognizes FAT-16 and FAT-32, but NT sees FAT-16 and NTFS (the NT file system). If you want NT to share disk partitions and application code with your other operating system, you'll have to adopt the lowest common denominator: FAT-16. Although you'll lose some disk space, the compromise ensures that all your operating systems can see all your files.

— Michael Desmond

ON THE WEB, NO ONE KNOWS HOW SMALL YOUR COMPANY IS. Netfinity 3000. Build a reliable network that runs Windows NT® or other operating systems. Start doing business on the Web. Your choice of Lotus® Domino™ or Lotus Domino Intranet Starter Pack,™ 90-day IBM Start Up Support and a 3-year limited warranty are included. And with SystemXtra you can get a hardware, software, services and financing package. Visit www.ibm.com/netfinity or call 1 800 IBM 7255, ext. 4761.

Pentium® II processor up to 350 MHz / Up to 384MB ECC SDRAM memory / 100 MHz bus speed / From \$1,769*

 **e-business tools**



IBM



*Estimated reseller price to end users for model 8476-10U; certain features described above are available for an additional charge. Actual reseller prices may vary. For terms and conditions or copies of IBM's standard Limited Warranty, call 1 800 772-2227 in the U.S. Limited Warranty includes International Warranty Service in those countries where this product is sold by IBM or IBM Business Partners (registration required). MHz denotes microprocessor internal clock speed only; other factors may also affect application performance. IBM product names are trademarks of International Business Machines Corporation. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. Lotus, Domino and Domino Intranet Starter Pack are trademarks of Lotus Development Corporation. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. © 1998 IBM Corp. All rights reserved.

U.S. NAVY BRINGS COMMAND & CONTROL TO NT

Armed with extra security measures, the USS Blue Ridge takes NT on board. **By Bob Brewin**

IN THE EVENT OF A CRISIS, the commander of the U.S. Seventh Fleet doesn't need to leave the stateroom of his ship sailing off the coast of South Korea to determine the location of U.S., allied, or foreign forces in his area of operations. Instead, on board the USS Blue Ridge, Vice Adm. Walter Doran sits down at his workstation hooked into the ship's Secret Local Area Network, pops open the C2PC (Command and Control PC) application, and views a smart map. This gives him near real-time tracking data of friendly and potentially enemy ships, aircraft, and troops in the immediate area of the Korean peninsula.

Doran's NT workstation is one of the 350 clients installed on the Blue Ridge this year as part of a Navy-wide plan to outfit all its major ships and bases worldwide with NT clients, networked to a mix of NT and Unix servers. The Navy plans to use this global NT network to run its mission-critical command and control system, installing the new architecture on far-flung vessels such as the Blue Ridge and the USS Kitty Hawk carrier battle group and the USS Belleau Wood amphibious ready group, all of which have their home port in Japan.



The Navy is taking part in a departmentwide migration of its applications from Unix to NT. The Defense Department two years ago approved NT as part of its Defense Information Infrastructure Common Operating Environment (COE), which defines the standard software platform for command and control applications. COE originally was a Unix-only platform.

"With this network, we are now compliant with command and control systems being used throughout the Department of Defense," says Doran. "It gives us a tremendous boost in our ability to work with other services."

Cost, training, and ease of use lie behind the Navy's de-

cision to migrate its worldwide network architecture to NT, according to Rear Adm. John Gauss, commander of the San Diego-based Space and Naval Warfare Systems Command (SPAWAR), which developed Global Command and Control System-Maritime (GCCS-M), the Navy version of the Defense Department's new command and control system, and which manages its Navy-wide deployment.

The Navy can buy a 200MHz PC for far less than a Unix workstation, says Gauss. Capt. Roger Hull, the SPAWAR command and control system program manager before he retired earlier this year, estimated that by moving to NT, the Navy could cut its costs to be from one-tenth to one-quarter that of Unix workstations, with overall savings to the Navy in the \$20 million range.

Training sailors to use and maintain PC-based systems is "much easier" than doing so in Unix, according to Gauss, since even casual users now have familiarity with the Win-

dows NT-based environment. Andrew Cox, a SPAWAR systems engineer, says, "we are probably seeing a better return on our investment for user training on NT [than Unix] ... When you go over to NT, users are just more familiar with it, reducing the time we spend training them."

The Blue Ridge had a similar experience with its staff users after the NT network went on line. "On the user side, it is a lot easier for someone to sit down and start using different applications [because of the Windows interface]," says Cmdr. Pat Cole, the Seventh Fleet's information systems officer, "reducing the amount of training and dedicated support we have to provide to the staff." But, Cole added, the ship has had to deal with a "not-too-steep learning curve" for its systems administrators. "We're still in the early stages of training our techies ... and that's a little more problematic."

While some commercial and even government users have taken a cautious approach to rolling out NT because of security and stability concerns, the Navy has no such fears. Before deploying GCCS-M on NT to operational users such as the Seventh Fleet, Gauss says, the Navy put the system through an exercise of "epic proportions" to test its stability and reliability. Bryan Scurry, the SPAWAR test director, says that during the test the NT-based GCCS-M ran "for more than 1,000 hours, and it passed with an operational availability of over 95 percent. In a couple of instances, that availability hit 98 percent."

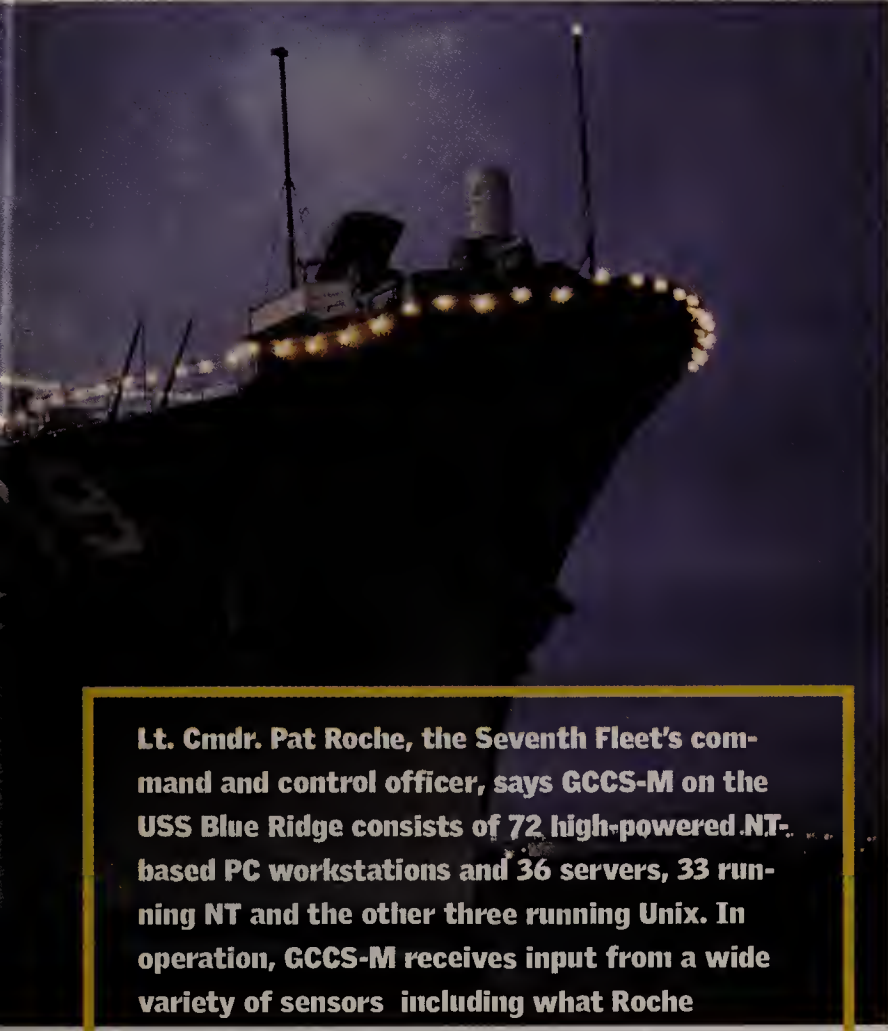
While professing faith in the security of NT, SPAWAR found out that it takes a lot of work to properly configure the operating system for the truly secure environment required to protect real-world national security information.

"NT right out of the box is inherently insecure, so we made sure all the 'hot fixes' are loaded. We've taken a defense-in-depth concept to make sure it is locked down," SPAWAR's Cox says. This approach includes immediately disabling the notoriously weak Posix software that comes with NT, controlling access to routers, and putting in firewalls, he says.

Anyone migrating to NT, Cox says, needs to "recognize that NT is not a secure system up front and then engineer a secure environment. We have a seven meg[abyte] document that describes all the things" needed to ensure that NT systems throughout the Navy have the fixes and patches needed to operate in one of the most mission-critical environments in the world.

Two months into the NT shakedown cruise, the Seventh Fleet's Cole says the problems that the Navy has encountered are "what happens when you install any new, complex system. I do know that our users are better off than they were under the old system ... and already my systems administrators are impressed on how much easier it is to administer [NT] than our previous system." *

BOB BREWIN IS AN EDITOR-AT-LARGE FOR FEDERAL COMPUTER WEEK.



Lt. Cmdr. Pat Roche, the Seventh Fleet's command and control officer, says GCCS-M on the USS Blue Ridge consists of 72 high-powered NT-based PC workstations and 36 servers, 33 running NT and the other three running Unix. In operation, GCCS-M receives input from a wide variety of sensors including what Roche described as "national assets," meaning spy satellites and electronic eavesdropping aircraft. It also receives tactical tracking data generated by friendly aircraft and ships that automatically report their positions by a secure radio data link. Roche says that the Blue Ridge has experienced some hiccups with its GCCS-M clients, but the lower cost of the units permits the staff to keep more workstations on board and makes swapping out machines easier — a luxury the Fleet staff did not have in the days it ran on a smaller number of Unix clients.

NANCY COHEN/BLACK STAR

By Brooks Talley

GROWING

YOUR
WEB SITE
ON AN NT
PLATFORM

USING MICROSOFT's Internet Information Server (IIS) and several of its accompanying products and technologies, businesses can operate everything from the smallest Web site running on Windows NT Workstation up to mission-critical Internet commerce sites on huge farms of NT Servers. However, IIS' ability to serve such a wide range of roles can be both a blessing and a curse.

In general, Web sites can be broken down into roughly three levels of complexity: a static site, a site with dynamic content, and a site with complex business applications. While IIS is suitable for these types of sites, the more complex a site becomes, the more IIS buckles under the strain.

BASIC SITES

For organizations that are just starting to put a Web site together or that plan to place relatively meager demands on their site, IIS is a good place to start. The software's appeal for basic, low-volume Web sites revolves around two key points: a low price and the ease of use and administration for novice Web developers and server administrators alike.

An IIS server can be as simple as a low-end NT workstation, and IIS itself doesn't cost anything extra because it comes with the operating system.

Another key attraction for novice users is IIS' built-in support for FrontPage Extensions — a technology that more closely integrates Web servers with content design programs. FrontPage Extensions work in conjunction with Microsoft's FrontPage Web editor to greatly simplify site design. It is eminently possible for someone with no experience

running a Web server or designing Web pages to use IIS with FrontPage to put up a respectable Web page in no time at all.

FrontPage quickly loses its luster, however, as users become more experienced. In order to get things just right, you will need finer control over page layout than FrontPage allows. FrontPage also is well known for scrambling page formatting (especially scripts), so designers who want to be able to work directly with HTML will quickly tire of having the spacing of their scripts ad-



PHILIP ANDERSON

Instinct may lead you to the right server OS. Or, you can always fall back on data, reason, and logic.

Microsoft® Windows NT® Server 4.0 was released two years ago. Today, 61% of networked companies in the U.S. are using it. And, Windows NT Server 4.0 currently outsells all other server operating systems. Why?

First, it covers the basics. Many companies choose Windows NT Server for great file and print. In fact, LAN administrators pick it 3 to 1 over NetWare for their basic LAN OS. But many companies also rely on Windows NT Server for much more than file and print. That's why it's called a multipurpose server OS, and why research shows that more companies choose it for their intranet platforms and commercial Internet platforms.

As you make your server OS decision, know that companies are choosing Windows NT Server because it handles basic networking and the ever-changing needs of today's business environment.



justed for them.

In addition, FrontPage Extensions are notoriously insecure, and a novice administrator may be lulled into a false sense of security after just tossing up an IIS server with the extensions on it. Also, novice administrator probably won't be aware of the need to install the various "hot fixes" for NT's security problems.

DYNAMIC WEB CONTENT

After setting up a basic, static Web site, the next natural step is to add some interactivity and dynamic content to the mix. It's time to work with either Visual Interdev, Microsoft's higher-end site development tool, or something like Allaire's Homesite.

IIS runs 22.5% of Web sites compared to Apache's 51.8%.

Source: Netcraft (www.netcraft.com/survey).

Both are code-oriented, rather than graphical, and both are more appropriate for serious Web development because they don't try to do too much for the developer.

Of course, these sophisticated tools go hand in hand with using some of the more advanced features of IIS. Probably the first thing you will start doing at this stage is using Active Server Pages (ASPs) to add some dynamic content to a site. Dynamic content can be simple at first — adding a page counter or customizing a greeting — and eventually it can be more complicated, such as using calendars or dynamically generated JavaScript. ASPs are also ideal for processing forms. They work by embedding a scripting language into what was previously a pure HTML file. They support VBScript and Jscript, Microsoft's implementation of JavaScript, out of the box.

COMPLEX BUSINESS APPLICATIONS

IIS really becomes a ready-to-run platform for line-of-business applications when you use it as a front end to a database. Connecting a Web site to a database opens up a world of possibilities such as order

tracking, data entry, and electronic commerce. ASPs are well suited for this connection, and VBScript has a wide array of data access tools that are both flexible and powerful. Basic operations, such as looking up records in a database, are an absolute breeze to write using Visual Basic, and even inexperienced coders should be able to get along with the help of the sample files that come with IIS. What's more, Visual Interdev has several tools that help make it easier to program database front ends. However, these tools are best suited to simple queries and data presentation — if you're going to do something truly complex, you'll have to code by hand.

Initially, ASPs work well with Microsoft

Access as a database, but Access isn't really meant for multiuser applications such as a busy Web site. By avoiding Access altogether, you won't

have to wonder whether the problems you encounter during development are your own fault or a symptom of Access' limited capabilities. Starting out with Microsoft's more robust SQL Server is a better idea, though it does add to the initial cost.

If your organization is like others that have discovered the benefits of establishing a Web site, you may have a monster on your hands because of the inevitable way Web sites organically grow and because you didn't centrally plan for the final design. Lack

of attention to code reusability and proper programming structure can make it a nightmare to maintain code — all because you started with the dynamic content limited to "Good evening, [username]" and let it grow from there. At this stage, most IIS applications go through something between a rewrite and a major housekeeping effort. Commonly used code needs to be isolated into "include" files that are reused, and likewise with constants that may appear in more than one place.

In addition, you may have learned that VBScript, while powerful, simply isn't fast enough for some processing. That limitation can be overcome by moving business logic into SQL stored procedures and moving slower code into stand-alone ActiveX components. Those components are compiled binary files that act something like Windows DLLs: They include a bunch of logic and an interface for getting to it. ActiveX controls simplify application design by tightly grouping related functions together, as well as performing faster than VBScript.

TRANSACTION SERVER

All of that work leads onto the next step on the slippery slope: using Microsoft Transaction Server (MTS) to further compartmentalize transactions. At first glance, the name suggests something database-centric, but in this context, a "transaction" is everything from creating an ActiveX com-

Where your Web site can go with Microsoft's IIS

	BASIC WEB SITE	BASIC DYNAMIC SITE USING ACTIVE SERVER PAGES (ASP)	ADVANCED APPLICATIONS	BUSINESS APPLICATIONS	LINE OF BUSINESS APPLICATIONS	ENTERPRISE APPLICATIONS
Code Used	HTML	HTML/ASP	HTML/ASP	ASP/HTML	ASP/HTML	ASP/HTML
Editor Used	FrontPage	FrontPage/ Visual Interdev	Visual Interdev	Visual Interdev	Visual Interdev/ Notepad	Visual Interdev/ Notepad
ActiveX Controls	None	None	Intrinsic	Intrinsic + 3rd party	Intrinsic + 3rd party + custom	Intrinsic + 3rd party + custom
Stateful*	No	No	Yes	Yes	Yes	Yes
Database Used	None	None	None	Access/ SQL Server	SQL Server	SQL Server
Microsoft Transaction Server	No	No	No	No	Maybe	Yes
Suitability to task	Excellent	Excellent	Excellent	Very Good	Good	Satisfactory

*STATEFUL WEB SITES KEEP TRACK OF INDIVIDUAL USER SESSIONS

**With the right server OS, you can stay a step ahead.
With an industry of applications and support, you can
make it two steps.**

Over 4,000 applications are built to run on Microsoft Windows NT Server 4.0. That's a lot of options. And over 170,000 people have been certified to help you with Windows NT Server installation and service. Furthermore, every major OEM is building solutions around Windows NT Server. So you can choose from a wider variety of hardware.

If you choose Windows NT Server 4.0, you're choosing to keep your software and hardware options open. You're also choosing an industry of support to help you solve today's problems, and to help you think about tomorrow's.



ponent to a page load on an MTS-enabled site. MTS provides a saner framework for using ActiveX components, treating each component as an object that can be created, checked out, and ultimately reused. It also allows "packaging" of multiple components to further organize things. However, MTS is a relatively new product, and everyone knows Microsoft's record with new products. In my experience, adding MTS to a site greatly helps organization, but it can result in performance and stability problems.

If you've come to this point, you've ba-

Sash Communications' Vip Patel decided against implementing Microsoft's Web technology.



JAYE BLAKESBERG

sically pushed IIS to its limit, and you may be wondering why you started down this path in the first place. IIS is a great Web platform and has a lot to recommend it, but if you take it to the extreme, the experience can be harrowing. Contending with the complexity introduced by using NT, IIS, ASPs, ActiveX, SQL, and MTS all at the same time can make troubleshooting a real nightmare. You may even have second thoughts about using IIS and fantasize about moving to some sort of Unix-based application Web server. However, these too have their own quirks and issues. Once you've taken the time and effort to come this far, there's a lot to be said for sticking with the devil you know. *

BROOKS TALLEY IS TEST MANAGER AT INFOWORLD'S TEST CENTER.

FREE WEB SERVER! YOU GET WHAT YOU PAY FOR

By Lynda Radosevich and Dana Gardner

Some users applaud Microsoft's move to include Internet Information Server (IIS) with Windows NT Server at no additional charge because it makes launching a Web site both cheap and easy. But others feel that, free software or not, the elbow grease required to make IIS a stable platform for more sophisticated Web sites is just not worth it.

Proponents say IIS is a great platform on which to build intranets, particularly when you're trying to keep within a budget.

"[IIS] is the best thing available for intranet development because of the integration with technology like Active Server Pages. And it's free," says Justin Renquist of Renquist Consulting Group in San Francisco, a designer of networks with such clients as clothing maker Levi Strauss.

But while it may be great for Intranet development, IIS can be troublesome for companies running heavy-duty electronic commerce sites, which often require links to payment services and fulfillment systems. Microsoft offers Transaction Server 2.0 to handle such transactions, but some users find it is too difficult to make NT, IIS, and MTS perform adequately.

At Sash Communications in Sunnyvale, California, Microsoft's offerings didn't make the grade. The company makes turnkey systems for health insurance companies that sell over the Internet. It needed foundation Web and transaction server technology and was attracted by the price tags on IIS and Transaction Server.

"We were tempted from a business model to go with what was free," says Vip Patel, president and chief executive officer of Sash Communications. But after speaking to IT directors at several companies with well-known electronic commerce sites, the company rejected Microsoft's technology as immature, and purchased Netscape's Application Server instead.

"If you're betting millions of dollars worth of business on it, thousands of dollars for the underlying middleware doesn't make a difference," he says.

TheProShop.com, a golf equipment retail site based in Ft. Myers, Florida, also faced scalability problems with IIS. The shop's Web site receives an average of 44,000 hits per day. Webmaster Greg Parker tried to move from an Apache Web server to IIS 3.0 on NT 4.0 for easier management, but the Microsoft technology stalled and crashed after he loaded 40 of the 50 domains needed. So Parker offloaded e-mail processing to a Linux server and reverted to running Apache on Sun Microsystems' Solaris 2.6.

"IIS was too slow to use, a big resource hog, and required too much RAM and resources to run the Web site," says Parker. "I was disappointed."

Still, some professionals say that companies can use IIS to handle high volumes of transactions and visitors. Ernst & Young Consulting successfully uses IIS to build heavy-duty transactional sites for its clients, says John Parkinson, a chief technologist in Ernst & Young's Dallas office. The trick, he says, is understanding how to hand off transaction processing to another server.

"If you understand how to build the architecture, you can scale as big as you want to go," Parkinson says.

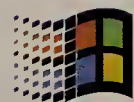
—Lynda Radosevich is a Senior Editor and Dana Gardner is an Editor at Large at InfoWorld.



What's more important: the present or the future?

Both. The companies and partners who support Microsoft Windows NT Server 4.0 are integral to the development of Windows® 2000 Server. So if you base today's solution around Windows NT Server, you'll have a solid migration path for both your network and your applications. And you'll know that the industry you are counting on will be with you down the line.

As you take the time to make your server OS decision, you may want more detailed information. We've assembled some new resources for you at the Web address below.



Windows NT®
Server 4.0

www.microsoft.com/go/WindowsNTServer/

Microsoft®

Where do you want to go today?®

Sources: US networked use and sales run rate: Sofres Intersearch Network Operating System Share Study, 1998. LAN administrator preference: ZD Market Intelligence, September, 1998. Most popular commercial Internet platform for self-hosted companies: Netcraft Web Server Survey, 10/98. Most popular intranet platform: Zona Research, Inc., "Internet and Intranet: 1998 Markets, Opportunities, and Trends."

©1998 Microsoft Corporation. All rights reserved. Microsoft, Windows, the Windows logo, Windows NT and Where do you want to go today? are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Other product and company names mentioned herein may be the trademarks of their respective owners.

NT Server and Your Network

A MATCH MADE IN HEAVEN OR INTEGRATION HELL?

While NT Server has proven itself useful in key areas, getting it to work with other environments can be frustrating and costly. Planning, third-party software, and outside help can ease the burden. **By Christine Burns**

THERE ARE AS many reasons to force a marriage between your existing network and Windows NT Server as there are integration hoops you'll have to jump through to make that union work.

Consider the case of the Drooker brothers. In 1993, Andrew and Matthew Drooker, both IS directors at Turner Broadcasting Sales Inc. in Atlanta, took the plunge with NT Server. Andrew, in charge of network implementation, needed to deploy Microsoft's then brand-new server operating system to anchor a distributed SQL Server database application, developed by brother Matthew to track worldwide advertising revenue for the parent company, Turner Broadcasting. Today, more than 60 percent of Turner Broadcasting's annual income is tracked via this NT application, and the sales department has swapped out its old Digital Pathworks network in favor of 125 NT servers. Despite this successful NT implementation, the honeymoon ended quickly: The Drookers need to continuously come up with new and creative ways to keep the sales force connected to the IBM mainframes at Turner Broadcasting headquarters, also in Atlanta, which has yet to take the NT plunge in any organized fashion.

Or consider Rick Shope, NationsBanc-DPFX's manager of PC technology, who four-and-a-half years ago wanted to wed the 800 high-end desktop PCs at the bank's Chicago-based trading arm to NT Workstation. He had hoped to give the traders a more robust, reliable platform for running office automation and financial applications. But in order to reap the full benefits of that union, he had to make room in his predominantly Hewlett-Packard Unix-based network for NT Workstation's overbearing mother-in-law, NT Server, as the primary network operating system.

And in New York two years ago, soon after the merge of Chase Manhattan Bank and Chemical Bank, the technology infrastructure division of the combined company was on the receiving end of some parental "direction" from upper manage-



ment to make a full-scale commitment to Microsoft's NT Server, in the name of operating system standardization. But a wholesale rip-and-replace of the bank's existing Netware network was not cost-effective, so dealing with dueling operating systems has become a daily struggle for Chase Manhattan.

These examples illustrate perhaps the biggest issue facing organizations that have decided to go with NT Server — once you've decided that there's a place in your company for the operating system, how do you get it to play nice with what's already running?

THE NT CHALLENGE

Regardless of how Microsoft's foot got in the door of corporate America, the Gartner Group predicts that by the end of 1999, NT Server will have made its way into 95 percent of large enterprise networks — defined by Microsoft as networks with more than 1,000 desktop PCs attached. But NT Server hardly ever stands alone in an enterprise network, says Neil MacDonald, a senior research analyst at Gartner.

"One of the biggest challenges in IT to-

Gartner Group predicts that by the end of 1999, NT will have made its way into 95 percent of large enterprise networks.

day is making NT [Server] work peacefully in your environment," says MacDonald.

For smaller companies, NT integration is not much of an issue, since the tendency is to use one operating system throughout. In fact, due to historical questions of scalability and manageability, NT Server traditionally has held its strongest market position in small companies where there are fewer than 150 users, says Daniel Kusnetzky, program director for client and server environments at Framingham, Massachusetts-based International Data Corp.

"It is less painful for smaller shops to standardize on NT Server than it is to use either Netware or Unix and deal with the hurdles to get them to work together," he says.

But for those large companies that need to go the mixed-environment route, deploying NT Server with existing systems is not something that happens quickly — nor cheaply. Before embarking on this task,

take some practical advice from users who have gone before you. Know what you want from NT. Understand exactly where it will — and won't — mesh with what you've already got. And don't go it alone.

WHAT'S IT GOOD FOR?

While Microsoft would have you believe that NT is an all-purpose operating system, you have to narrow down what exactly you want NT to do for you. Experienced users say NT works well as a database, messaging, and Web platform. But for large-scale network operating system deployment or mission-critical applications requiring a stable, scalable operating system, they say you should look elsewhere.

"It's not an all-or-nothing game at this point," says Kathy Cruz, chief information officer at Aspect Telecommunications, a computer-telephony integration firm based in San Jose, California. "You have the luxury of putting [NT] where it works and sticking with something else where it doesn't. We are lucky

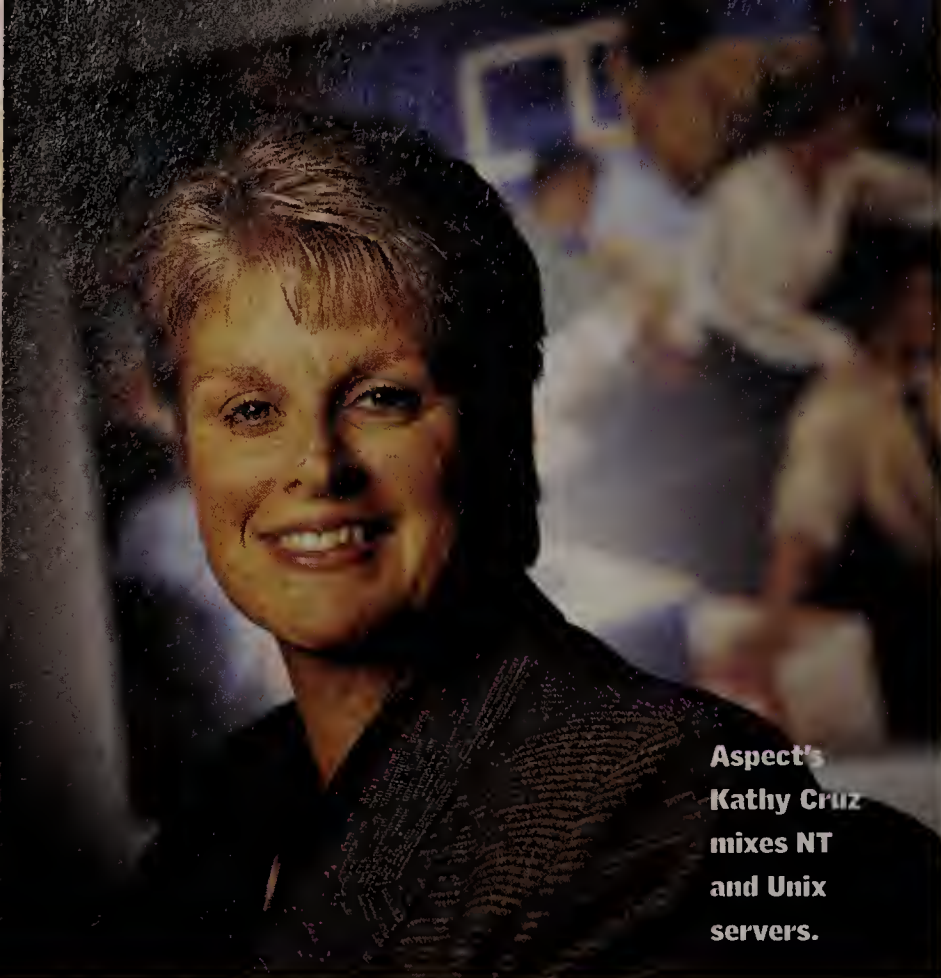
enough to be able to buy an application based on what it does for us rather than what [operating system] it runs

on." NT Server first made its way into Aspect's network two years ago when the company swapped out Lotus' cc:Mail for Microsoft's Exchange. From there, it made sense for Cruz to replace the company's Netware file and print servers with NT Server to cut in half the number of servers she maintains.

MAKING IT WORK

Once you've decided where NT Server best fits into your organization, you need to think of integrating it into your network on several levels, including giving users access to data stored on disparate hosts, maintaining multiple underlying security architectures, and performing cross-platform systems management.

For simple file-level access across NT and Unix servers, you will need to deploy software that makes one server impersonate the other. Products like Advanced Server for Unix, which AT&T supplies to sev-



**Aspect's
Kathy Cruz
mixes NT
and Unix
servers.**

ERIC MILLETTE

eral Unix vendors, sit on top of a Unix server and make data residing there as readily available to users as if it were sitting on another NT server. In the reverse, Unix vendors now offer Network File System server software that gives users of predominantly Unix-based networks access to data residing on an NT server. For Netware integration, both Microsoft and Novell offer add-on software that allows an NT server to store files in a Netware environment and vice versa. Accessing data on mainframe and minicomputer systems can be done via Microsoft's BackOffice component, SNA Server.

Andrew Drooker said emerging NT Server technologies — like Active Server Pages — help him provide even more accessible connections to Turner's host systems. An ActiveX control sitting on the SNA Server machines in Atlanta allows end users in Turner Sales' London, Paris, and Tokyo offices to establish terminal sessions inside their browsers over the Web.

But while data access in a mixed environment seems to be under control, managing NT's underlying network architecture with Unix- or Netware-based ones is a major obstacle to full NT integration. This is because NT Server's access rights are defined by network resource groupings called domains, which, when layered on top of user access rights already in place for Netware or Unix, become redundant and costly.

For Lynn Houseknecht, senior vice president of Chase Manhattan's distributed

computing services division, the trick is getting a network of 400 NT servers to run parallel to the company's 700-server Netware file and print network. Because of the complexity of NT domains, Chase chose to administer the two environments separately. Although Microsoft intends to remedy its domain problems with a full-blown directory service in NT 5.0 sometime next year, Chase Manhattan can't wait that long. Yan-

ny Hecht, vice president in charge of architecture within Chase Manhattan's distributed computing services group, says that by year's end the company will move to centralized administration using Novell's Directory Services for NT.

Cross-platform systems management is another area that these experienced NT users label a concern. This task may be getting easier — within the last year, system management platforms like IBM's Tivoli, Computer Associates' Unicenter, and HP's OpenView have gained NT support. But if you run a mixed Unix and NT network and haven't invested heavily in one of these expensive management platforms, your op-

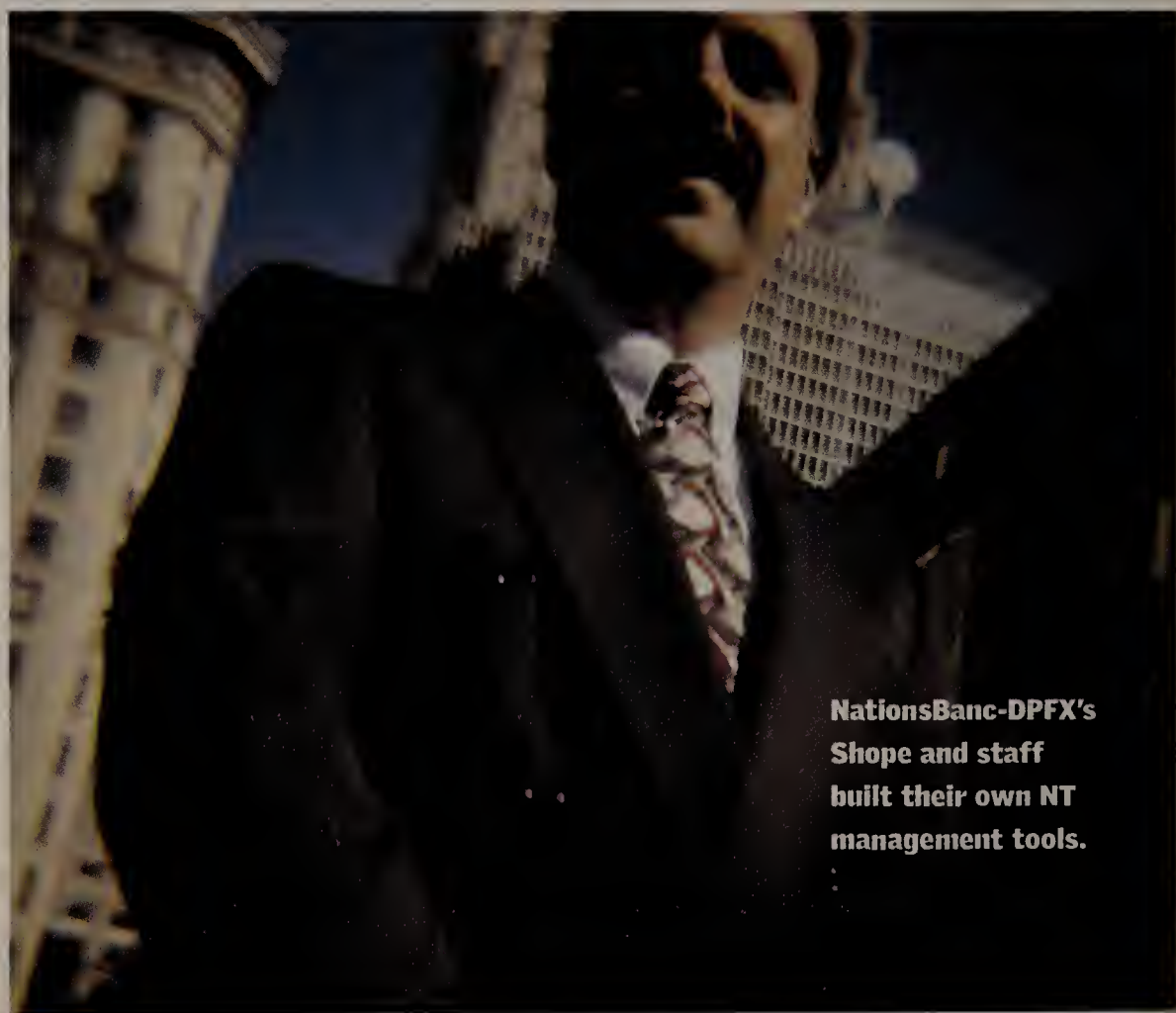
tions are limited. To get unified server management tools across NationsBanc's HP-UX and NT boxes, Shope had to build his own by porting a homegrown set of Unix management tools to NT. For mixed Netware and NT environments, users can turn to Novell's ManageWise desktop and server management software or to third-party products like Intel's LANDesk or Compaq's Insight Manager.

YOU NEED HELP

With the proliferation of NT in corporate America, experienced NT professionals willing to work in-house are at a premium. Chase Manhattan had to raise its salary bar significantly to attract — and keep — people who can work with both the Novell and the NT systems. Aspect's Cruz offers a tuition reimbursement program for employees pursuing Microsoft certification. "But even then, you're only guaranteed that person knows NT. It's very rare to find someone who has a real deep understanding of multiple [operating systems]," says Cruz, who payrolls separate NT and Unix staffs.

By 2000, when Gartner estimates the market for NT services will exceed \$10 billion annually, "getting outside help will be a way of life for anyone looking to put NT Server into the mix," says MacDonald. *

CHRISTINE BURNS IS A SENIOR EDITOR AT NETWORK WORLD.



**NationsBanc-DPFX's
Shope and staff
built their own NT
management tools.**

CHRIS VOLK

Developing NT Expertise

Companies take varying paths to acquire NT know-how **By Leslie Goff**

NONE OF THE MEMBERS of the networking staff at the American Cyanamid Agricultural Research Center are Windows NT-certified. They haven't attended any formal training, nor have they sought the guidance of consultants. Instead, when networking manager Kim Takayama's staff plunged into migrating a 1,000-user DEC Pathworks environment to NT five years ago, they grew their own expertise.

With 10 to 15 years of systems experience each, the staff members found that NT's ease of use and their own understanding of basic systems principles were enough, says Takayama.

"We tried a little training here and there to see what we liked, and we found that with the group of people we have here, we prefer doing it on our own," Takayama says.

Takayama's staff is an exception to the rule: Most organizations looking to build internal expertise in Microsoft's Windows NT are turning to external consulting, mentoring, and training to help bring NT know-how in-house and keep it there. Larger companies tend to favor long-term consulting arrangements, supplemented by intensive classroom training. Smaller firms usually go a more economical route, working with one consultant for a few days and then getting more information from the Internet, books, or maybe the local community college.

Mentoring ensures a bigger bang for your NT buck. However, those who have experienced it say you shouldn't just bring in outside help to advise you on NT configuration and performance. It's better to have specialists work side by side with permanent team members to explain what is being done and why.



"My background has taught me that mentoring — having someone watch you do the work and correct you — is better than a class, which is not real-world," says Christopher Smith, a certified Microsoft professional, certified Novell engineer, and network manager at Innova, a manufacturer of wireless telecommunications equipment in Seattle. A seven-day consulting and mentoring arrangement ate up about 20 percent of Innova's \$350,000 consulting and training budget, Smith said.

At publisher Lippincott Williams & Wilkins, the support of a technology-savvy CEO opened up the training cash flow. Because management understood the business drivers for moving from four different operating systems to NT, vice president and chief information officer Marion Mullauer was empowered to do whatever it took to acquire the expertise Lippincott needed.

She hired two new team members who are "NT-conversant," brought in consultants to make recommendations, established mentoring relationships, and is sending 10 staff members through the full cycle of NT Server and

NT Workstation training. Mullauer won't reveal the dollar amount she has spent on NT training and consulting, but says it accounts for 15 percent of her IT budget.

Organizations that lack Lippincott's resources have sought more economical paths to developing internal NT expertise. A small credit union in Columbus, Ohio, for example, is skimping on NT expenses so it can allocate the majority of its

\$30,000 IT training budget for 1998 to conferences and seminars on disaster recovery, electronic commerce, and Internet technologies.

"For what we are doing, we could find a better use for the \$2,000 an NT class would cost. That's the thing that's

Many companies choose mentoring, pairing staff with experienced NT consultants.

so nice about NT — it's all pretty basic and self-explanatory, really," says Steve Sims, information technology manager at Telhio Credit Union.

Still, in August the company paid between \$300 and \$400 to bring in a consultant for a day to evaluate system setup and optimization, and to teach Sims' two Unix administrators how to create new user accounts, change passwords, and perform other administrative basics.

"Now that we have NT up and running, we want someone to come in and make sure our i's are dotted and t's are crossed," Sims said. *

LESLIE GOFF IS A FREQUENT CONTRIBUTOR TO COMPUTERWORLD.

JOHN S. DYKES

The State of NT Security

Is Windows NT secure enough to protect your data? **By Peter Ruber**

WHEN IT COMES TO security, Windows NT reviews are mixed. Some praise NT for having good security underpinnings, citing a consistent interface with which administrators can control access and manage users. But others question the value of deploying Microsoft's Windows NT for business-critical enterprise applications and especially for Internet commerce.

For every praiseworthy security feature, there seems to be a dark side. "NT is unbelievably complex to secure," says Sidney Feit, an analyst with Standish Group International, in Dennis, Massachusetts, "because Microsoft hasn't clearly documented all its security procedures." He claims that a side effect of NT's code being so large and immature is that it's riddled with holes and bugs, making it a tempting target for hacker attacks.

As it frequently does for its operating systems, Microsoft has responded with patches and "hot fixes" for many well-publicized problems. That's disconcerting for network managers and chief information officers expecting robust software out of the box, say critics, adding that Microsoft should deliver better-tested products instead of relying on customers to find the problems. "Microsoft is spending too much time cleaning up after the horse has left the barn," complains Jim Hurley, industry analyst for the Aberdeen Group, in Cambridge, Massachusetts.

INTERNET VULNERABILITY

Even more disconcerting is NT's vulnerability over the Internet. Problems with authentication and application-level security plague Microsoft's

Internet Information Server (IIS), say critics. To secure NT Server, administrators have to turn off network broadcasting services (the services that let devices communicate with each other), which could lobotomize the system if administrators go too far, says John McCown, technical director of networks for the International Computer Security Association (ISCA), in Carlisle, Pennsylvania.

H. Morrow Long, Yale University information security officer, believes it is possible to make NT secure with relative ease. "If you keep your wits about you, you can build a secure NT network," he says. "If you're running NET-BIOS over TCP/IP, where each machine is broadcasting information about itself, there are ways of turning these off on an Internet-accessible server. But a lot of administrators don't know how to do that."

As a security precaution, Long recommends migrating all users and servers to NT 4.0, turning off all Microsoft services in the NT Web server

and never connecting a Web server to an internal NT domain. "There shouldn't be any file sharing or file mounting between the two," he recommends. For better security, access to back-end systems should be handled only through SQLNET or other database protocols. Finally, he strongly advises installing Microsoft's Windows NT Service Packs and all hot fixes posted on Microsoft's security Web site since then and getting on the Computer Emergency Response Team (CERT) and NTBUGTRAQ mailing lists.

Will NT 5.0 be more secure? No one's betting their bankroll. Some users and analysts fear NT 5.0's larger code base will open even more black holes, touching off another round of endless hot fixes and further delaying its chances for enterprise deployment. Microsoft's challenge is to successfully integrate stronger security features into the heart of NT 5.0. *

PETER RUBER IS A FREQUENT CONTRIBUTOR TO CIO.



MELINDA BECK

The U.N. has a charter.

*Democracy has the
Constitution.*

**The Information
Age has IDG
publications.**

Words have the power to unite, to define, to set a course. And when words appear between the covers of IDG publications, they have an even greater power: they influence the most critical economic force in the world today — the technology buyers driving the information age.

IDG is the only publisher with the breadth of trusted resources to reach the full spectrum of IT buyers. With IDG publications like CIO, Computerworld, InfoWorld, Network World and PC World (and 290 others in 75 countries), you have the highly targeted, relevant editorial that buyers turn to first.

IDG also provides opinion, insight and inspiration through more than 200 Web sites, their leading research company — IDC, best-selling book titles and numerous worldwide industry events. All of which makes IDG the most trusted source for technology information anywhere in the world.

Answers for the Information Age

www.idg.com

IDG
INTERNATIONAL DATA GROUP



Eight branch offices.

Need high-performance application access.

Over 95 concurrent users.



Small Pipes.

No sweat.

With Citrix server-based computing solutions, you can deliver faster application performance for more remote users without upgrading your network.



Right now, Citrix® MetaFrame™ and WinFrame® server-based computing software is being used by thousands of successful companies to ensure their various users throughout the enterprise get lightning-fast access to the latest Windows®-based applications.

10x faster application performance over existing remote connections.

Optimized for network connections as low as 14.4 Kbps, Citrix software enables IT professionals to deliver up to 10x faster response over existing remote-node servers and branch-office routers. This way, every remote user can get LAN-like performance, even with 32-bit applications, regardless of whether they're using analog or ISDN modems, WANs, wireless LANs or the Internet.

Reduce network traffic and increase application availability for more users.

Since all processing is done at the server, your vital applications consume as little as one-tenth of their normal network band-

width. This level of efficiency means that administrators can increase the number of concurrent users working with a specific application to keep productivity levels high.

See what 77% of the Fortune 100 already knows—Citrix works!

Discover today how thousands of leading organizations are using Citrix MetaFrame and WinFrame to improve their remote application performance for more users. All without breaking a sweat.

To learn how Citrix can help you, call 888-564-7630 or visit us on the Web at www.citrix.com/drive7 for a FREE Test Drive CD-ROM.

CITRIX®

Presented by:



To Benefit:



the **computer** museum

Corporate Sponsors:

<allaire>



Gill Fishman Associates



IPSWITCH

Lucash, Gesmer
& Updegrove, LLP

Boston Attorneys at Law

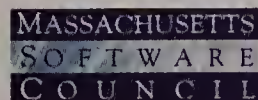


PRICEWATERHOUSECOOPERS

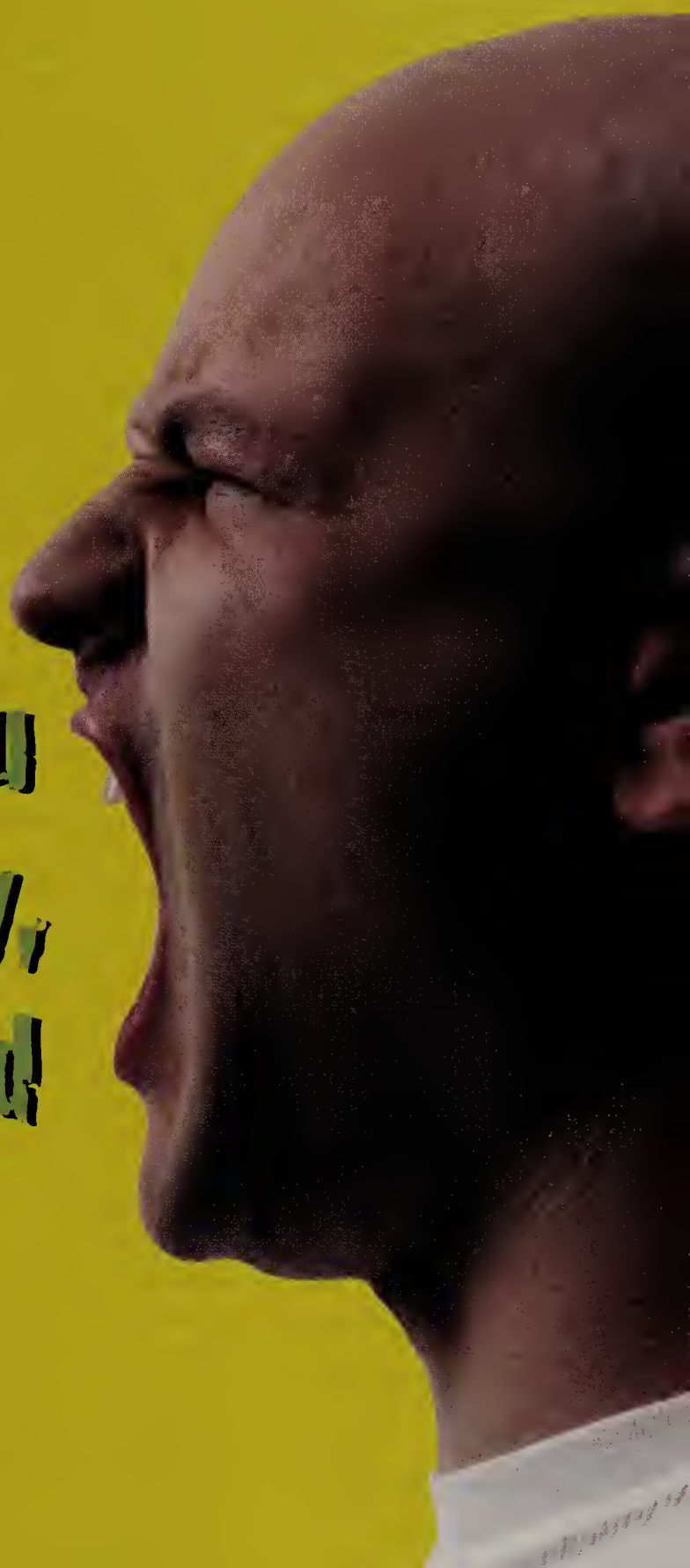


TRINITY®
Communications, Inc.

Trade Associations:



Sleep
deprivation
can make you
hallucinatory,
demented and
delusional.



[Not to mention the world's best Web designer.]

Visit our gallery at WWW.WEBMASTERS98.COM and see what the world's most talented Web designers can do in 24 hours of inspired, unbridled creativity. It's as if they had been saving their best work just for the Masters of the Web competition. And for helping seriously ill children. So drop by our gallery.

HUMAN RESOURCES

of the increasingly elaborate stew of benefits options. "Sears is [a set of] different companies with different target markets and different kinds of people and skill sets needed. And that plays in to a need to tailor not only things like pay and benefits programs but everything that makes up the relationship with associates," Millen says.

Likewise, Ford is using the Beneflex system in its call center and plans to roll out a full-service upgrade of its current HR intranet to some 330,000 employees and a roughly equal number of retirees by the middle of 1999. The call center application lets representatives look up benefits and HR policies based on the caller's salary grade, union status and other factors. When Ford makes the system available at large, users will be able to view their pay stubs online and conduct transactions such as changing addresses. According to Tod Loofbourrow, president and CEO of Foundation Technologies, Ford is the largest company rolling out an employee self-service HR application on national basis.

Providing this level of Web-based HR self-service is no mean feat. Sears plans to integrate the Beneflex knowledge application with its PeopleSoft HR management system and a self-service voice response system from Edify Corp. Sometime in the future, when an employee calls and uses the phone to enter his or her Social Security number, a Web page with the caller's personal benefits plan will pop up on the call center representative's desk. "But it's going to take some time to connect all the pieces together," says Gail Holmberg, director of HR systems for Sears in Hoffman Estates, Ill. She explains that her staff will have to hand-code scripts that enable the different programs' databases to exchange information.

Ford also has a big integration job ahead before it can launch its full-service HR Web system. Employees are spread around the world. Some are unionized, some are salaried. Many different systems, from new PeopleSoft systems to older, custom-coded ones, furnish HR data. "Pulling that together and presenting it simply and concisely to an employee is a difficult task," says Geoffrey Scott, supervisor of human resource information for Ford in Dearborn, Mich. One method Ford is considering is to use scripted rules to present custom interfaces for each employee.

Another technical hurdle is extending Web access to employees who don't have PCs on their desks. In addition to giving employees home PCs, Olin's Chlor-Alkali division set up semiprivate workstation kiosks for its workers without regular PC access at work. At Sears, most sales

associates don't have PCs, and the overall cost of technology will have to come down radically before the company makes the HR intranet universally accessible, Holmberg says.

By letting employees access their own data, HR staff can spend more time attending to more vital tasks.



Ken Millen: A new intranet lets Sears' HR call center staff answer questions quickly.

And, of course, companies must set up a self-service culture. To get employees excited about its HR intranet, Carolina Power & Light created a videotape hosted by a claymation character who explained what employees could do with the new system and why the company created it. The company mailed the videotape plus a booklet and training programs on floppy disks to all of its employees' homes in December 1996. The video caused a buzz, and callers soon contacted the project team with their concerns. Primary among them was whether their data would remain private (see "Fear of Prying," Page 59).

In January 1997 the company brought the intranet online, but the transition wasn't entirely smooth. "We also went live with a conversion to Microsoft Office, and users were still suffering hangover from that. There were many changes hitting them at the same time," says Gray. The utility's help desk assisted workers in overcoming their anxieties and technical issues one question at a time. Now users are accustomed to the system and employ it to answer many of their own questions.

Indeed, the Web is helping companies like these concentrate more on their core businesses and less on HR, while still enabling them to keep strategic HR services in-house. "We needed to get people focused on the fact that we are in the chemical business. We're not in the payroll business, we're not in the print or paper business. Those are things that we needed to automate yet still provide," Gilley says. The Web, because of its broad access and familiar browser interface, is the right technology at the right time for doing so, he says, but only if a company has built the right culture first. **CIO**

Lynda Radosevich is a senior editor at InfoWorld. She can be reached at lynda_radosevich@infoworld.com.

we get **IT** done.

How can your Information Technology help you achieve a competitive advantage? Call Keane. We use rigorous process and management disciplines to develop and manage software. And we tie performance metrics to the specific needs of your business. Our approach continuously improves the performance of IT. So you can improve time-to-market, flexibility, customer satisfaction and productivity. Let Keane help you plan, build and manage a high-performance IT organization.

Call 1-888-KEANE-98
www.keane.com



we get **IT** done.

At the verge of the 21st century, companies must leverage the enormous opportunities continually created by technological advancements to better meet the intense demands of complex information networks, an increasingly dynamic global economy and the never-satisfied customer. In effect, the channels of information distribution and the ways companies have customarily added value and organized their work have been deeply impacted by IT.

Using a combination of case studies and interactive lectures, we will learn how Pioneer Hi-Bred International, a \$2

"CIOs must focus on integrating business strategy or changing it based on technology capabilities - this Retreat helps us on this path."

ROBERT COLANGELO,
CIO, BAUSCH & LOMB

billion corporation and the world's leading developer, producer and supplier of seeds, has incorporated new research technology and production methods

through substantial IT investments and marketing approaches across its 31 worldwide locations. We will also examine how Amazon.com continuously enriches its on-line retailing and services organization to better meet the needs of its 3 million active users in over 160 countries.

**To register, please call
800 355-0246 or
visit our Web site at
www.cio.com/conferences**

CIO

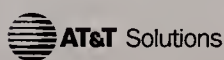
THE SEVENTH ANNUAL

Enterprise Value Retreat & Awards Ceremony



ENTERPRISE VALUE RETREAT PARTNERS:

Proud Underwriter
of CIO magazine's
Enterprise Value Awards:



SUNDAY, JANUARY 31

Registration and Breakfast

Golf Tournament at La Paloma Country Club

Transportation to La Paloma Country Club will run continuously starting at 10:30 a.m. from the main entrance of the Westin La Paloma.

Registration

Retreat Welcome

JOSEPH L. LEVY, *President, CEO and Group Publisher*
CIO Communications, Inc.

Retreat Introduction

F. WARREN MCFARLAN, *Senior Associate Dean,
Director of External Relations,
Albert H. Gordon Professor of Business Administration*
Harvard Business School

Retreat faculty will open the program and set goals and objectives.

Partners' Café Reception

Meet other participants and Retreat Partners in an informal living room setting.

MONDAY, FEBRUARY 1

Opening Remarks and KnowPulse PollSM

JOSEPH L. LEVY

Let your opinions be known through this well-reported research poll.

Amazon.com: Book Retailing and the Internet

BRANDT R. ALLEN

*James C. Wheat, Jr. Professor of Business Administration
Associate Dean for Executive Education*

*Darden Graduate School of Business Administration
Executive Director*

*Tayloe Murphy International Business Studies Center
University of Virginia*

Since its inception in 1995, Amazon.com has provided customers in more than 160 countries with an online source for millions of books, CDs, audio books, DVDs and computer games.

Amazon.com: Retailing and the Internet

BRANDT R. ALLEN

The realization of competition.

INDUSTRY BRIEFINGS

Discuss the latest thinking and newest approaches to information technology management with executives from our Partnering organizations.

Information Application Targets for the Early 21st Century

F. WARREN MCFARLAN

Discover the ways information technology will be applied in the next century.

Partners' Café Reception

TUESDAY, FEBRUARY 2

New IT-Enabled Organization Structures and the Roles of Intranets and Extranets

F. WARREN MCFARLAN

Examine ways new channels of communication evolve the structure of organizations.

Case Study: Pioneer Hi-Bred

F. WARREN MCFARLAN

Explore the business and technology issues facing this \$2 billion global seed company.

Case Study Workgroups

Participants will break into small groups to analyze the case.

New Paradigms for IT Service Sourcing

F. WARREN MCFARLAN

Observe the major shifts in access to unconventional IT service sourcing.

Enterprise Value Awards Reception

Meet the Awards winners.

Enterprise Value Awards Ceremony and Dinner

Join us in celebrating the Enterprise Value Awards recipients, proudly underwritten by AT&T Solutions.

GARY BEACH

Publisher

CIO magazine

ABBIE LUNDBERG

Editor in Chief

CIO magazine

LEW MCCREARY

Editorial Director

CIO magazine

WEDNESDAY, FEBRUARY 3

KnowPulse Poll Results

LEW MCCREARY

Case Study Workgroup Presentations and Discussion

JOHN JAMES

Executive Vice President

Pioneer Hi-Bred

THOMAS HANIGAN

Vice President and Director of Information Management

Pioneer Hi-Bred

F. WARREN MCFARLAN

Groups will present and discuss their solutions with Pioneer Hi-Bred executives.

Case Study Epilogue and Reflections on Pioneer Hi-Bred

The case study company executives respond to breakout group solutions.

Delivering IT Results in the Information-Mediated Age

F. WARREN MCFARLAN

Summary

F. WARREN MCFARLAN



BOOZ ALLEN & HAMILTON

COMDISCO

COMPAQ

Data General

NOTEL
NETWORKS

Novell

ORACLE

PLATINUM
TECHNOLOGY

PRICEWATERHOUSECOOPERS

Tivoli

Promote and Deliver

*Before you put out the welcome mat,
know who might come calling*

BY JIM STERNE

THEY SAY THERE ARE TWO KINDS OF PEOPLE IN THE WORLD: those who believe there are two kinds of people in the world—and everybody else.

When it comes to online consumers, the folks at the McKinsey & Co. consulting firm (www.mckinsey.com) believe they have identified four kinds of people: settlers, surfers, direct buyers and indirect buyers. Each group has different demands. Each responds to different stimuli. Most important, each approaches the Web in a different way.

Michael Zeisser, McKinsey's principal partner, divides the four types of Web consumers along two different axes: wandering versus staying put and buying from the manufacturer versus buying from go-betweens. So we end up with that classic research company four-square diagram divided into

- Those who buy direct and like to wander
- Those who buy direct and like to settle
- Those who buy from intermediaries and like to wander
- Those who buy from intermediaries and like to settle

This medley of mouse manipulators determines how you promote your company on the Web and the type of information you host on your site. The categories also affect the way you deliver goods and services to an increasingly point-and-click world.

Directed Wanderers

In the beginning, the business Web consisted primarily of independent company sites, each selling its own products. Before the search engines decided to become portals, the only choice was to surf from site to site in order to buy direct.

Lots of potential customers still use the Web this way. These independent do-it-yourselfers need to gather their own information and make up their own minds. And they want their information from the source.

Attracting these people hasn't changed much with the Web's evolu-

tion. Buying banner ads, advertising your Web site on television and promoting your site through direct mail all still make sense. Getting to the top of the search-engine list is still an important, if elusive, goal. Since these users tend to drift from site to site, you need to invest a great deal of energy in getting them to return. Communities, memberships, frequent-buyer discounts, contests, news and personalization are a few of the tricks that can convince these wandering souls to become permanent fixtures.

Directed Settlers

An ideal world for vendors would be filled with people who like to settle and buy direct. They have definite prefer-



ences: They wear only Nike shoes. They will drive only a Trans Am. They buy only Clinique cosmetics. They have gone out into the marketplace and made their



BROKEN PROMISES.
SHATTERED DREAMS.

[just another day in IT]

THE FIRST STEP IS TO ADMIT
YOU HAVE A PROBLEM.

The quickest way to improvement is Empirical's 4-step Program.

You know your IT department has a problem. Internal customers want better, faster, and more reliable applications. Your CEO wants you to deliver IT cheaper, with less staff, while still meeting growing business demands. And you're in the middle feeling the squeeze. Empirical's 4-step program lets you plan, measure, predict, and improve the performance, availability, and recoverability of business critical applications. Empirical Suite, the leading end-to-end service level management solution, can improve your overall IT performance levels by as much as 100%. By aligning IT and internal business units, Empirical can minimize downtime, increase end-user productivity, and help improve the overall credibility of your IT department.

GET HELP NOW. Visit www.empirical.com/contact or call 1.800.933.7668 x 7562 for your **FREE Empirical IT Intervention Kit.** Or call and book a consultation today, and qualify for a **FREE PalmPilot™** with our compliments.

EMPIRICAL™
SOFTWARE

decisions, and they're not going to change their minds.

Companies that can offer enough value to lock their customers into an electronic relationship will reap the benefits of using data mining to increase their income. The old marketing saw says it costs 10 times more to acquire a new customer than it does to sell to one already in the fold. Using knowledge you already have about your customers is more efficient than spending the money to acquire new ones.

If you are, say, Harley-Davidson Inc., the strength of your image may be enough to bond customers to your brand for life. If you're not, it's time to get to know your customers better, so you can provide the image, the lifestyle and the attitude they crave. In either case, when dealing with settlers who buy direct, you'll need to invest in serious personalization tools. You'll need a server that will recognize your customers and treat them as individuals on a one-to-one basis. You'll need collaborative filtering that lets you make individual recommendations to help increase your share of each customer's wallet.

Fiercely loyal customers will add nothing to the bottom line if you don't find new things to sell them and new ways to do it. You'll also need to find innovative ways to capture new customers and bring them into the electronic fold.

Fickle Settlers

McKinsey found that 80 percent of the unique visitors to one book site never go to another online bookseller. Once those visitors learn how to use one site, such as Amazon.com, and once that site learns their preferences and buying habits, they're hooked. This type of marketplace is inhabited by people who settle and buy from intermediaries. If that were true of everyone looking for all products, your course would be simple and clear: Become the niche portal site for your industry—imagine *www.left-handed-kitchen-gadget-world.com*—and do your best to get everybody to your gateway/portal/mall. Then go to the major portal players and buy yourself a banner with a home page advantage.

If your industry has no central repository of information, education and transactions, people looking for your

products have no choice but to surf. Within a relatively short period, your customers can compare all products and their prices on the screen simultaneously. In this type of market, you have fallen into the commodity zone. You don't have a chance to make your value statement, put forth your Unique Selling Proposition or position your product against your competitors'. You can either drop your price or you can put everything you've got into your brand.

If you are already the low-price leader, then you stand to win. You've already figured out how to produce an acceptable level of quality at an acceptable level of profit at a bid-winning price. Whether your prospects are direct buyers or prefer intermediaries, you've got the edge.

But if you tend toward the high end of the price spectrum, you've got a different challenge. When the surfers look for a two-door automobile and see your new Cadillac next to the new Volkswagen Beetle, the brand better speak volumes. If they're buying on price, you lose. Simple. But if they're buying on brand, then you're still in the game. If they are

Using knowledge you already have about your customers is more efficient than spending the money to acquire new ones.

buying prestige, you're out in front. Obviously, that means you have to pay particular attention to how your products are perceived in the marketplace—and also who is doing the perceiving.

Fickle Wanderers

People who like to surf and also like intermediation will love "infomediaries." These automated agents could collect information about the surfer, negotiate with potential vendors and try to make a match. While it usually seems as if the big promise of artificial intelligence has never delivered, it's time to investigate how Extensible Markup Language (XML) can change the way information is found, formatted and delivered.

Finding almost anything on the Web today is a challenge at best and massively frustrating the rest of the time. Searching for "chicken stock" at any of the major engines will return poultry breeders,

soup recipes and the share price of Zacky Farms. But XML changes that picture; it lets you fill your site with metadata. XML tags such as <product>, <name>, <company>, <price> and <shipping> allow a search engine to change your pages from a collection of individual text elements into meaningful information that can be manipulated, compared, contrasted and served up by an infomediary. Knowing that this is coming, it's time to daydream about tags like <value>, <quality> and <exclusivity>. (For more on XML, see "X Marks the Spot," CIO Section 2, Feb. 1, 1998.)

If the products you sell come cloaked in exclusivity and brand loyalty, there's work to do, but it's straightforward work. It's still just a matter of catering to those who love you and doing everything in your power to keep them safely in your grasp.

Who's Out There, Really?

The basic question McKinsey hoped to answer is, How do people use the Internet? But maybe the question isn't whether there are different kinds of peo-

ple but whether buyers' habits depend on what products they're seeking. If multiple manufacturers make multiple product choices for the same category like cars or clothes or calculators, then customer behavior on the Web will be different from when they shop for one-of-a-kind products such as software or music or farm equipment.

The onus is on you to conduct a Web visitor survey to determine just what category of surfers take a liking to your site. Then cater to them like there's no tomorrow. Keep asking them how they search and what they want, because what they want is sure to change from one survey to the next. **CIO**

Jim Sterne is the author of World Wide Web Marketing, Customer Service on the Internet and What Makes People Click: Advertising on the Web. He can be reached at jsterne@targeting.com.

To an IT manager, this is a pin-up.

TN3270E

REALLY
FAST,
REALLY
SMALL!

MAIN
FRAME
↓
HQ
AS400
↓
CALIF
NY
LONDON
BANGKOK
UNIX
↓
R&D

JAVA
REMOTE
CONFIG.

THIS ONE'S
SECURE!
Kerberos v4
SOCKS v4/V5

GET
VERSION 6
NOW!

FROM THE DESK OF
CHARLES SMITH, CIO

Get Evaluation
ASAP!
—CS



HUMMINGBIRD®
COMMUNICATIONS LTD.

HostExplorer

Now get the premier TN3270E, TN5250 and VT420 Terminal Emulations Suite for networked PCs, for Windows NT, Windows 95 and Windows all on one CD. Don't pay more for backwards compatibility. HostExplorer is designed to bring legacy applications into the future and it's ready today.

HostExplorer.
The terminal
emulation suite
that's getting
everyone excited.

Why do IT managers everywhere like HostExplorer so much? That's easy. They love the way it works right out of the box. How extremely fast it is — and how little memory it requires. And how it lets their network administrators control any desktop from any location.

The fact is, you won't find a better terminal emulation suite out there. HostExplorer gives you complete high performance PC-to-enterprise connectivity.

Find out for yourself why IT managers are getting so worked up. Contact us for an evaluation copy of HostExplorer.



HUMMINGBIRD®

Have It Their Way

Tools for Web service let your customers get the help they need—when and how they want it

BY JOHN EDWARDS

I

RYING TO SERVE CUSTOMERS THROUGH a Web site used to be like feeding hungry masses with the limited menu of a fast food restaurant: Companies were OK as long as their customers stuck to the conformity of a burger-and-fries service request. But if users got fancy—if they wanted actual interaction on the Web site, or worse, wanted to request information via the Web and receive the answer over the phone—companies were stuck trying to make filet mignon out of ground chuck. They just didn't have the right ingredients or tools to satisfy.

To make matters worse, the fast-paced, always-open nature of the Web has redefined customers' expectations for service. If a company's Web server is dishing up pages 24/7, customers want to know why they can't reach a service rep at 2 a.m. The Web never sleeps, so why should the customer service department?

The good news is that new, sophisticated tools can help automate and streamline online customer service—as well as provide a larger menu of options. Even better, those tools are starting to integrate so that companies can respond to customers through their channel of choice, whether that is e-mail, online chat or phone, says David Cooperstein, a senior analyst for telecom strategies at Cambridge, Mass.-based Forrester Research Inc. (www.forrester.com). "Consumer demand for Web service has really pushed the development of the market," Cooperstein says. "Companies are starting to realize that the Web isn't a standalone element, and it's not just a way to save money on customer service. It's a channel to provide the same kind of service you provide over a phone. And customers are cross-channel users." Cooperstein expects the market for Web service tools, currently at \$11 million, to top \$650 million by 2002.

And the pressure to divert customer traffic from a call center to the Web is intense: Forrester estimates that companies using Web solutions typically save 43 percent over strict call-center models.

While the solutions available today may not be shrink-wrapped steak, they can at least give a company the tools to let customers have it their way—and save the company money. Tools can be categorized in a gradient, from least interactive (e-mail) to most interactive (chat or live calls).

You've Got (Too Much) Mail

The baseline for good online service is fielding customer e-mail in a timely, accurate way. Simple, right? Just hit the "reply" button. But that's easier said than done when a company handles hundreds or thousands of requests per day with a limited customer service staff. "In terms of online customer service, e-mail is causing the most pain for companies today," Cooperstein says. "Because of the



ILLUSTRATION BY ALISON SEIFFER

Stream Team
Page 72

**Surf's Up
to No Good**
Page 74

Secure Selling
Page 74

**E-mail in
Palm of
Your Hand**
Page 76

**The Virtual
Salesperson**
Page 76

HOLY WAREHOUSE LEVERAGE, INFO-MAN!!

SPSS
GIVES ME THE
POWER TO
KNOCK OUT THE
COMPETITION!

SPSS
THE BEST WAY TO
CREATE & DISTRIBUTE
DECISION-MAKING
INFORMATION!



**DATA
MINING**

**CUT
COSTS**

GREAT ROI

CALL
1-800-525-6870
TODAY!



**INCREASE
REVENUE**

**REPORT
OLAP**

**FAST
ROLLOUT**

**WEB
READY!**

**STATISTICS &
MODELING**

EASY TO USE

www.spss.com

SPSS®

SPSS is a registered trademark of SPSS Inc.
Info-Man is a copyrighted character of SPSS Inc.
P&SAD-1098C10 A6870

sheer volume, it's a tough thing to do well."

Victor Gee feels that pain. Gee, senior manager of technical support and customer service at PointCast Inc. (www.pointcast.com) in Sunnyvale, Calif., says his department fields tens of thousands of e-mails per week when a direct marketing campaign is underway. The desktop news delivery service uses a Customer Messaging System from Kana Communications Inc. (www.kana.com) of Palo Alto, Calif., to deal with its bloated digital mailbag. The tool uses artificial intelligence technology to sort incoming e-mail, weed out the "spam," or electronic junk mail, and then automatically route the remaining messages to designated staff members. Message storage, routing and analysis, as well as reporting functions, are handled by a Web-based application running Windows NT using either Microsoft SQL Server or Unix-based Oracle as its data store. "When viewers write us with a problem or question, we can take that response verbatim and send it directly to the engineers for their input," Gee says.

Another handy feature in CMS is the ability to develop a knowledge base of responses to customer questions and create standard response templates, ensuring that customers receive consistent, high-quality answers. CMS's automatic responses can be based on message content, sender address, recipient address and other message elements. CMS can also boost the productivity of customer service representatives by giving them hot-key or menu access to the CMS response library.

In addition, the software's productivity reporting feature lets Gee track customer service reps' efficiency and responsiveness. "It gives us a benchmark way of measuring performance. We've also found that the product is so easy to learn that it has actually boosted the training efficiency of new hires on our team," Gee says.

Talking and Surfing Together

What if e-mail won't cut it? Your customer needs information now, not in a few hours or days. Mike Gelardi, senior product manager for Symantec Corp. of Sunnyvale, Calif., faced that problem with his customers. The software company, whose products include Norton AntiVirus software, wanted to create a "priority service" for Web customers that would allow them to get faster answers from a live representative—for a price—when they needed them.

By using ChatNow and @Once Service

VIDEO CACHING

Stream Team

Partners smooth out Web video

THE WEB IS A FRUSTRATING, unreliable medium for watching video clips or participating in a video conference. That's because multimedia requires loads of bandwidth—often more than the Web can reliably provide. Too often, the multimedia Web experience consists of herky-jerky images and intermittent sound outages. But a recent development could soon make video feeds on the Web a lot smoother.

Seattle-based RealNetworks Inc. (www.real.com), the developer of RealAudio and RealVideo software, and Inktomi Corp. (www.inktomi.com) of San Mateo, Calif., an Internet infrastructure software developer, have teamed up to develop the first streaming media cache solution. Today, when users download multimedia data, it travels from the host server through myriad Internet switches and servers to the user's Internet service provider (ISP) and finally to his or her desktop. Each junction in the data stream is subject to delays and dropped data packets.

RealNetworks and Inktomi aim to reduce the junctions between the multimedia file transmission and the user by caching multimedia data streams at a user's ISP. As a result, the multimedia file will travel from users' ISP servers directly to the desktop. Video and sound files will have a more direct route to the browser yielding higher quality audio and video. The caching software will provide clustering capability so that a data stream can be stored

on multiple servers, a necessity for ISPs. "Streaming eats up a lot of cache space and processing power," explains Dennis McEvoy, vice president of development and support for Inktomi. "You can quickly run out of capacity on a single box."

The two companies were testing the technology this fall and expected it to be available by year's end. This technology is another advance en route to the ultimate goal of full-scale video-on-demand over the Web. The biggest hurdle to that goal is to speed up "the last mile" to the home, McEvoy says. The good news: Cable and telephone companies are competing aggressively to provide high-speed Internet service. So, McEvoy says, advances such as multimedia stream caching in conjunction with improved data compression technology and upgraded telecommunications networks could make video-on-demand a reality in a few years.

—Peter Fabris





Do You Have More Band Than Bandwidth?

**Slow and congested Internet access... Frustrated users... Lost customers... Irrate management...
Is your Internet connection the source of all these problems?**

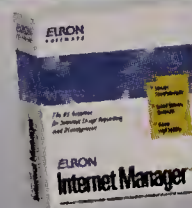
If you think adding costly bandwidth will solve these problems, think again. More bandwidth only adds more uncontrolled traffic. The only real answer to your problems is to take control of your Internet connection.

Let Elron Bandwidth Optimizer Put You In Control. Elron Bandwidth Optimizer reveals how your bandwidth is being consumed, and enables you to allocate and prioritize your Internet traffic, ensuring your connection runs smoothly, and customers, key users, and critical applications have the bandwidth they need.

Elron's CommandView Product Family. Elron Bandwidth Optimizer is the latest addition to the Elron CommandView Product Family. This integrated

family of Internet management products will maximize the value of your Internet connection with performance and productivity management solutions.

Elron CommandView Product Family



*Internet Usage
Management & Reporting*



*Internet Security
Management*



*Internet Bandwidth
Management*

ELRON
SOFTWARE

To find out how Elron Bandwidth Optimizer can help you take control of your Internet connection, call (800) 767-6683 or visit our web site www.elronsoftware.com and request your FREE Bandwidth Management Kit.

Center from Business Evolution Inc. (www.businessevolution.com) of Princeton, N.J., the company set up a chat feature that allows customers to request a live chat session as they surf Symantec's site. For \$19.95 per session, a customer gets connected to a technician who can help sort through the problem. ChatNow keeps a log of the conversation, which is then sent via e-mail—providing the customer with a valuable reference if the same problem should arise in the future.

ChatNow also has a feature that allows a technician to “co-surf” with a customer in Symantec's extensive knowledge database. The chat client offers a split screen that can provide space for discussion while the technician leads the customer to the area on the site where the question is answered. “It's a multimedia response to a problem,” Gelardi says. “I'm talking you through the problem at the same time that I'm showing it to you.”

For Gelardi, the @Once Service Center product addresses the need for speed of one segment of customers. “Some people don't have the time to wait, or they just plain don't want to. We have to be able to accommodate that need.”

Linking It Together

The epitome of Web customer service is to have a seamless integration of multiple channels—all tied to your customer service database. Ascend Communications Inc., a network infrastructure technology provider for telcos, Internet service providers and corporations, is approaching that model with a new method of online service it launched in November with Acuity, formerly known as iChat. Ascend uses both Acuity's WebCenter and iChat products. Ascend, based in Alameda, Calif., has tiered service so that technicians can get the help they need, at a price they're willing to pay. The extensive ramp-up came in part because of a customer focus group the company ran with some surprising results, says John Pohl, senior director for global integration service marketing. “We found out they were looking for something non-traditional. They wanted to bypass the phone and our call center entirely,” Pohl says. “They were telling us, ‘I'd not only pay extra to get this service, I'd consider switching vendors to get it.’” That was a powerful incentive for the company to invest in its online service.

Ascend has an extensive knowledge database online and also has chat capabilities as well. But the moment that visitors to the Web site requests a chat session, all of the information about which pages they have visited, their company information, records of any previous uses of customer service (using the phone or Web) is delivered to the technician who fields the chat session. “We know who we're interacting with before we even say hello,” Pohl says. The software also has an intelligent agent that prescreens the customer based on the chat request form. The agent searches the site for any pages in the knowledge database that might relate to the customer's question and delivers those to the technician.

The company intends to use its chat capabilities for such unusual services as broadcast chat sessions in which it will run seminars for large groups over the Net giving instruction on installing or troubleshooting a particular technology.

Service or Marketing?

Ultimately, the right services with the right integration can

BROWSER

Surf's Up to No Good

Is the latest breaking news story grinding your company's network—and employee productivity—to a halt? Spyglass Inc. offers a version of its SurfWatch filtering product aimed at the corporate market. SurfWatch Professional Edition 2.0 allows companies to monitor or block the kinds of sites with content that can sap employee productivity, such as news or investments, shopping or sex. Companies can customize filtering by user or group. They can also specify different levels of access at different times of day; for example, they can decide to let employees view news and real estate sites during lunch hour but block them during the rest of the workweek. Available for Microsoft Corp. and Netscape Communication Corp.'s proxy servers and Check Point's Firewall-1, SurfWatch Professional Edition pricing starts at \$995 for a single server supporting 50 users. Spyglass, in Los Altos, Calif., can be reached at 650 948-9500; more information on SurfWatch is available at www.surfwatch.com.

—Sari Kalin

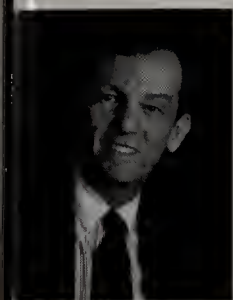


Secure Selling

Sterling Commerce Inc., based in Dublin, Ohio, has expanded the capabilities of its Gentran Web Suite to improve electronic commerce. Web Suite links businesses and their customers, suppliers, partners and employees using a Web interface. Some of its new features include secure Internet transport using a Web browser or PC application and an improved security system using dual encryption. This allows for secure registration, password secure authentication, managed recovery, system synchronization, automatic updates and two-way transaction acknowledgment. The Suite also provides automated document flow between your business and your partners for easy exchange of information. For more information, visit www.sterlingcommerce.com or call 800 299-4041.

—Kathleen Carr

ILLUSTRATION BY ROBIN ZINGONE

**CIO**

Gary Beach
Publisher, CIO Magazine
Keynote speaker



CIO Roundtable

Gary Beach brings over ten years of IT publishing experience and knowledge to his role as a publisher of CIO magazine. A prolific speaker, Beach is a coveted spokesman throughout the U.S. His recent appearances include testifying before the U.S. Senate Special Committee on the Y2K Problem as well as keynote addresses for the Chicago Software Association and the United Nations on behalf of the Association of Information Technology. He also serves on the U.S. Department of Commerce's National IT Workforce Committee. During his tenure with IDG, Beach has also served as CEO of IDG's Computerworld and Network World magazines. Prior to joining IDG, he held several executive positions at McGraw-Hill.

Keynote Speakers from America's Leading Organizations



Orlando Ayala
Senior Vice President
America's and South
Pacific Region
Microsoft



Robert H. Samson
General Manager
North America Government
IBM Corporation



Jim Flyzik
CIO
U.S. Department
of the Treasury

The first 500 people to
pre-register via the web will be
entered to win a complimentary
conference package! See
website for details.

Official Non-Profit



Exhibit and Sponsorship
Opportunities are extremely
limited.

Secure your participation in this
exclusive event now! Call Don Sader
at (503) 670-6175.

Or visit our web site at:

www.mdtechshowcase.com

Maryland's Largest Technology Event

BUSINESS



EDUCATION



CITIZEN SERVICES

GOVERNMENT



State of Maryland

Diamond Sponsors



Platinum Sponsor



LOCKHEED MARTIN



Gold Sponsors



MARYLAND technology SHOWCASE

December 9 - 10, 1998
Baltimore Convention Center
10:00 am - 5:00 pm

FEATURED TECHNOLOGIES:

- Intranet-Extranet
- Y2K Solutions
- Enterprise Computing
- Help Desk
- eCommerce
- Telecommunications
- Mobile Computing
- Distance Learning
- IT Security
- Multimedia
- Digital Imaging
- Office Automation

Event Partners



National Internet, Local Service.

David D. Lattanze
Center for Executive Studies
in Information Systems

become a strategy for more than customer service—they can become a way to market new products and build your brand. A service from Update Internet Permission Marketing Systems Inc. (www.permission-marketing.com) of Laramie, Wyo., helps companies blur that line between marketing and customer service significantly. The company's Update offering is a Web-based tool that allows businesses to distribute outgoing e-mail alerts in the form of an announcement, newsletter or electronic coupon.

Update keeps past visitors apprised of new products, special promotions, close-outs and other events. Update Internet Permission Marketing Systems supplies its Update customers

"What we're moving toward is media blenders that at the end of the day help manage your customer interaction, no matter which channel you use."

—David Cooperstein

with the HTML text block that's needed to add an Update link to a Web site. The company also provides a secure Web-based account area for administering mailings. Users can insert an unlimited number of notification fields into their template. Update breaks down responses by interests, age, income and other criteria.

Da Vinci Gourmet Ltd. (www.davincigourmet.com), a Seattle-based maker of syrups, sauces and chocolates, uses Update to alert site visitors to new products, price changes and other breaking developments. The service proved handy earlier this year when the firm implemented its online ordering system. "A lot of people had expressed interest in this feature," says Brad Houser, Da Vinci's assistant marketing manager. The firm installed an Update link on its site informing visitors that if they filled out a short survey form they would receive e-mail notification as soon as the service became available. "We sent out the e-mail as soon as the online ordering went live and we received a ton of orders, more than we ever projected."

No matter which combination of Web customer service tools you choose, the goal should be to erase the lines between different ways to interact, Cooperstein says. "What we're moving toward is media blenders that at the end of the day help manage your customer interaction, no matter which channel you use." While he says a best-of-breed approach is sound for small to mid-sized companies, Cooperstein says he recommends that Fortune 1000 companies look into using an integrator/provider, such as Lucent or Nortel, to develop a system that links into the sales and service systems already running outside the call center. "You want to use these technologies to do more than serve customers," he says. "You want to build a relationship." **CIO**

John Edwards is a freelance writer based in Mount Laurel, N.J. He can be reached at EdWords@prodigy.net.

BROWSER

E-mail in Palm of Your Hand

Whether you're on the road or working from home, Motorola's PageNet e-mailing system can keep you connected. Dallas-based PageNet has a new wireless device that allows you to send and receive e-mail and log on to both the Internet and your company's intranet. The palm-sized device allows you to send and reply to messages using a keyboard that folds into a screen. This gadget comes complete with preprogrammed replies (yes, no, thank you, will call later, be there in 5, 10 or 15 minutes) and will store incoming messages for 72 hours. The PageNet Two-Way device can be purchased for \$360 with service starting at \$24.95 per month. A lease-to-own plan is available for \$19 per month. For more information, call 972 801-8179 or visit www.pagenet.com.

—Kathleen Carr



The Virtual Salesperson

Ideally, a top e-commerce site should work a lot like a top salesperson—not just handling transactions, but upselling, tracking visitor preferences and predicting what they'll buy in the future. Net Perceptions Inc. of Minneapolis says that's possible with its Net Perceptions 4.0 for E-Commerce. Like its human counterpart, the software learns more about customers every time they visit, then uses that information to recommend other purchases. For more information on Net Perceptions, whose customers include Amazon.com, Ticketmaster Online and other Web business giants, visit www.netperceptions.com or call 800 466-0711.

—Kathleen Carr

ILLUSTRATION BY ROBIN ZINGONE



INDEX

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

ActivMedia Inc.	40
Alexa Internet	28
Alexus International Inc.	56
Amazon.com Inc.	16, 28, 66
America Online Inc.	16, 40
Answer Financial Inc.	16
Ascend Communications Inc.	70
Aurora Foods Inc.	28
Autobytel.com Inc.	28
Baan Co., The	56
Barnes & Noble Inc.	40
Bell Communications Research Inc.	16
Borders Online Inc.	28
Bureau of National Affairs Inc., The	56
Business Evolution Inc.	70
Carolina Power & Light Co.	56
Chip Shot Golf Corp.	28
Consumer Financial Network	16
Da Vinci Gourmet Ltd.	70
Dofasco Inc.	16
eBay Inc.	12
Edify Corp.	56
Encyclopedia Britannica Inc.	28
Enock Inc.	28
eToys Inc.	40
Excite Inc.	16
F.A.O. Schwartz	40
Ford Motor Co.	56
Forrester Research Inc.	26, 40, 56, 70
Foundation Technologies Inc.	56
GartnerGroup Inc.	56
Harley-Davidson Motor Company Inc.	66
Hasbro Inc.	40
Holt Educational Outlet	16, 40
IBM Corp.	28
Infoseek Corp.	16
Inktomi Corp.	70
Interworld	40
Inverse Network Technology Inc.	16
Junkbusters Corp.	16
Kana Communications Inc.	70
Lawson Software	56
McKinsey & Co.	66
Microsoft Corp.	70
Motorola Inc.	70
Multimedia Live	78
Net Perceptions Inc.	70
Netscape Communications Corp.	16, 28, 70
Network Marketing International LLC	26
NexGen SI Inc.	56
NPD Group Inc.	40
Olin Corp.	56
Opinion Research Corp. International	16
Oracle Corp.	56
Panmedia Corp.	28
Patricia Seybold Group	56
Paychex Inc.	26
PeopleSoft Inc.	56
PointCast Inc.	70
Preston, Gates & Ellis LLP	32
Priceline.com	16
Public Broadcasting Service	10
R.J. Reynolds Tobacco Co.	28
RealNetworks Inc.	70
Reinvent Communications Inc.	28
Restrac Inc.	56
Resumix Inc.	56
RewardsPlus of America Corp.	16
SAP AG	56

Sears, Roebuck and Co.	56
Southwest Airlines Co.	28
Spyglass Inc.	70
Sterling Commerce Inc.	70
Symantec Corp.	70
Taylor Steel Inc.	16
Thomson & Thomson	28
Toys "R" Us Inc.	40
TravelSmith Outfitters Inc.	78
United Parcel Service of America Inc.	28
Update Internet Permission Marketing Systems Inc.	70
VeriSign Inc.	28
Wal-Mart Stores Inc.	40
Walt Disney Co., The	40
Walt Disney Imagineering	50
Yahoo Inc.	16, 28

Advertiser Index

*Denotes Section 2 Advertisers

Amdahl Corp.	53
American Power Conversion	17*
Bell Atlantic (Regional)	37*
Best! Software	29*
Bluestone Inc.	33
Candle Corp.	62
CAP Gemini America Inc.	C3
CIO Communications Inc.	32A*, 33*, 37*, 42, 60, 64*
Cisco Systems Inc.	19
Compaq Computer Corp.	C2*, 14, 38*
Computer Associates Intl. Inc.	3, 8*, 45*
Compuware Corp.	27
Comshare Inc.	31*
Datalink	83
Dell Computer Corp.	C2
Digital Delivery	61
DLTape Systems	31
Dow Jones & Co.	37
EDS Corp.	73
Elron Software	73*
Empirical Software	67*
ETI	79
Exabyte Corp.	17
Gateway 2000	8
Great Plains Software	89
Hewlett-Packard Co.	48, 69
Hummingbird Communications	69*
IBM Corp.	11*, 23*, 51
Inacom Corp.	25
Intel Corp.	4, 32A
Keane Inc.	43, 63*
Kingston Technology	C4
Kronos Inc.	77
Lockheed Martin Corp.	91
Lucent Technologies	28, 71
Maryland Technology Showcase	75*
Masters of the Web	61*
MCI WorldCom	4*
Microsoft Corp.	87
MKS Inc.	47*
NEC	20*
Netscape Communications Corp.	39, 41
Network Associates	44, 48*
New Horizons Computer Learning Centers	95
Nortel	7*, 14*
NT World	60A*
Oracle Corp.	7
PeopleSoft Inc.	81
Peritus Software Services Inc.	13
Platinum Technology	C3*, 34*
Rational Software Corp.	25*
Remedy Corp.	13*
SAGA	55, 57, 59
SAP America Inc.	55*
SAS Institute Inc.	21
Segue Software	3*
Sprint	67
SPSS Inc.	71*
Storagetek	C4*
Tivoli Systems Inc.	85
TRW	93
TSI International	22
Unisys Corp.	11
UUNET	19*

CIO SALES OFFICES

President, CEO and Group Publisher

JOSEPH L. LEVY
508 935-4601

Publisher

GARY J. BEACH
508 935-4202

Senior VP/Sales

MICHAEL J. MASTERS
973 244-5500, Ext. 21

EAST COAST

Regional Director / Advertising Sales

FRANK S. GENOVESE
973 244-5500, Ext. 19

Regional Managers / Advertising Sales

EILEEN P. LOBAUGH
973 244-5500, Ext. 18

KATHY POWERS
973 244-5500, Ext. 14

Advertising Sales Associates

STACY G. GREIMEL
973 244-5500, Ext. 16

JOAN BONADEO
973 244-5500, Ext. 17

ANGELA FUNG

973 244-5500, FAX 973 227-1565

NEW ENGLAND

Regional Manager / Advertising Sales

LEN GANZ

508 935-4039

Advertising Sales Associate

STEPHANIE ROY
508 935-4092, FAX 508 872-0618

SOUTH CENTRAL

Regional Manager / Advertising Sales

ROBERT E. SAWDON

Advertising Sales Associate

SOUNTHALY OUTHAVONG
512 306-9801, FAX 512 306-9805

NORTH CENTRAL

Regional Manager / Advertising Sales

KEITH H. KENNER

Advertising Sales Associate

ANNE SWARTZ
847 441-5005, FAX 847 441-5150

WEST COAST

Regional Director / Advertising Sales

RICHARD BASTAS
415 693-1988

Regional Managers / Advertising Sales

JAMES BARRETT
415 693-1995

PAULA J. CONNOR
415 693-5634

Advertising Sales Associates

TIM LEONARD
415 693-5630

SYLVIA WEILER
415 693-5632

ALLISON WITTER

415 693-1994, FAX 415 398-4649

SOUTHERN CALIFORNIA

Regional Manager / Advertising Sales

NANCY A. COY

Advertising Sales Associate

JANIS WIKANDER
949 475-5579, FAX 949 475-5583

LIST SERVICES

List Services Manager

KATHRYN A.W. GRAYSON
508 935-4072

List Services Sales Associate

AMY McCABE
508 935-4151
800 859-5478, FAX 508 872-8506

CUSTOM PUBLISHING

VP / General Manager

ELLEN ROMANOW
508 935-4796

For further sales information,

visit our Web site at

www.cio.com/marketing/salesoffices.html

New Itinerary

www.travelsmith.com

This travel-products retailer wanted to provide customers with a rewarding journey into e-commerce

COMPANY

TravelSmith Outfitters Inc.

DESIGNER

Multimedia Live, Novato, Calif.

REASON FOR REDESIGN

TravelSmith Outfitters wanted to add an integrated e-commerce system to sell its travel clothing, luggage and accessories online. It also planned to develop consistent navigation throughout the site and aspired to build maintenance tools that don't require HTML writing.

QUOTE OF NOTE

Now "you can get to any product within two clicks," says Ken Burke, president of Multimedia Live.

Before



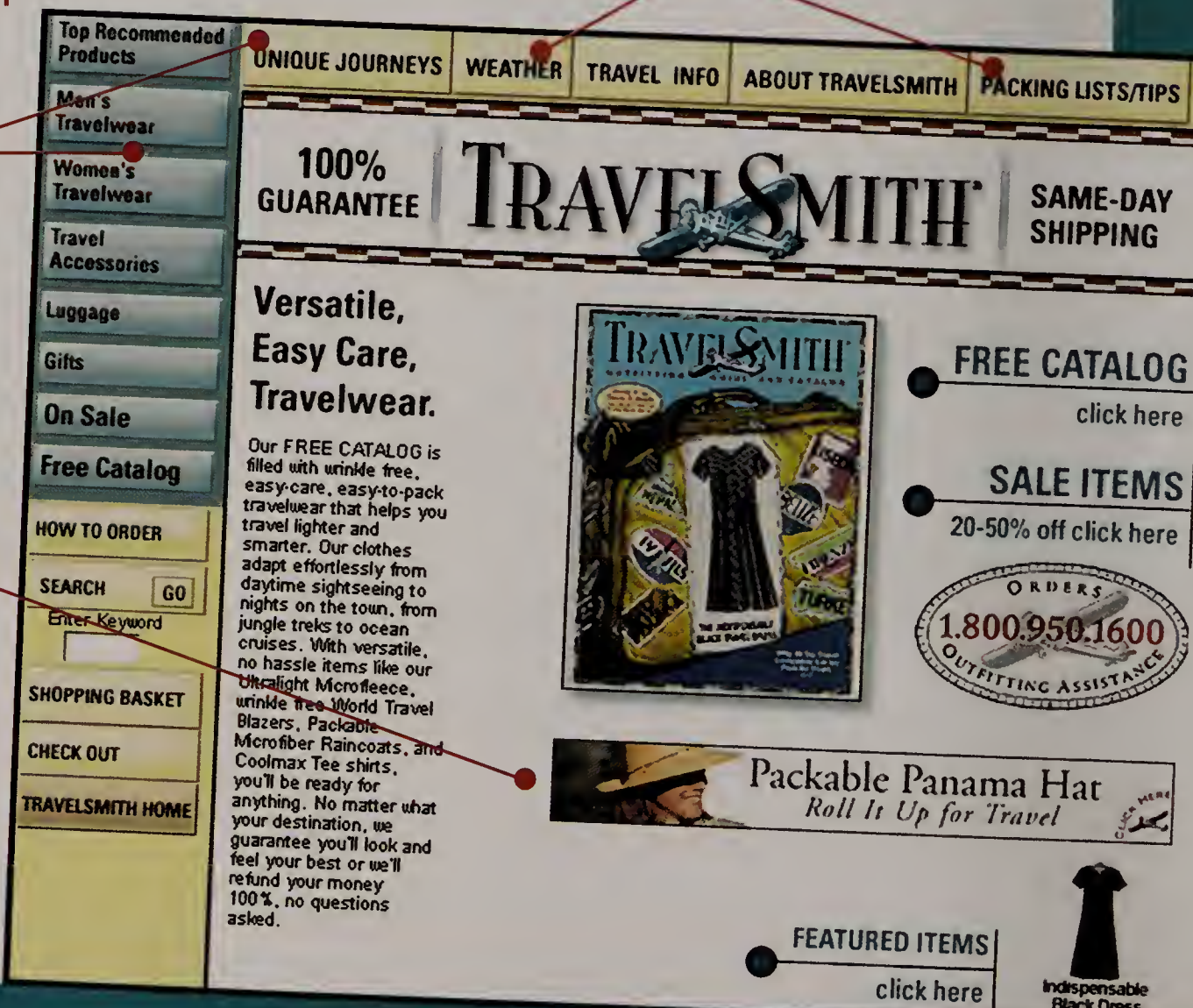
The old TravelSmith site offered inconsistent navigation and featured limited product selection. Customers couldn't order online.

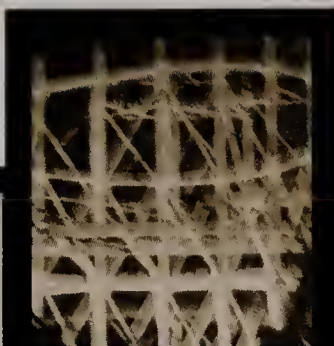
New content, such as a database of worldwide weather conditions and a region-specific packing list, provides customer service and helps drive sales.

After

Navigation frames stay the same on every page. Left-hand navigation bar points users to products, search function and online ordering. Top bar points to related content.

Ad server yields house ads and dynamically disperses them throughout the site, drawing visitors to additional products or sections.





Where does
infrastructure end



and business begin?

This isn't a trick question. Ideally, the IT infrastructure—data, systems, applications—should support even the most daring business initiatives from start to finish. Realistically, though, the infrastructure can also derail them. And ultimately, you're responsible. We understand just how daunting this position can be. So we provide the most comprehensive portfolio of products and services to manage and improve your IT infrastructure—from database and systems management to data warehousing, decision support, application lifecycle and Year 2000—all with a lot less risk. Because when you can spend less time looking back over your shoulder, you stay more focused on what's coming up ahead... where your business really begins. Why not start right now, right here?
www.platinum.com/shine

make **IT** shineTM

d a t a • s y s t e m s • a p p s

PLATINUM
TECHNOLOGY



He's not sure where the network closet is yet. But he does understand how vital information is to the success of the company. And with a StorageTek® solution in place, he knows his users can access, move and share that information effortlessly, across the enterprise. (Not a bad thing when you're the new guy.)

IT'S HIS FIRST DAY ON THE JOB. *(Of course he already knows everything.)*

With the latest StorageTek innovations, you can manage information in ways you never thought possible. Our unique OPENstorage™ solutions combine the best of disk and tape with ultra-SCSI and fibre channel connectivity, for exceptional speed of access across NT®, NOS and UNIX® platforms. And you'll have the power to control it all from a single location.

StorageTek solutions give you maximum scalability, so you can handle growth with ease. And built-in redundancy eliminates single-point failure, so your data is always available. All of which means storage you can feel confident about from day one. To learn more, call 1-800-STORTEK today, or visit us on the Web. Next thing you know, you'll know—well, pretty much everything.

www.storagetek.com/firstday

StorageTek®
Information Made Powerful™